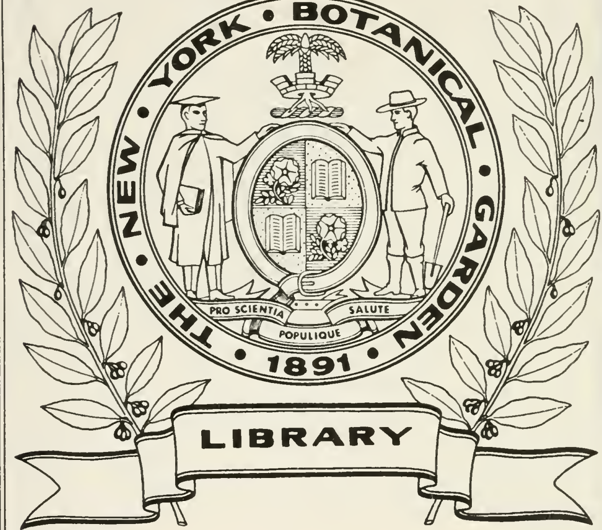
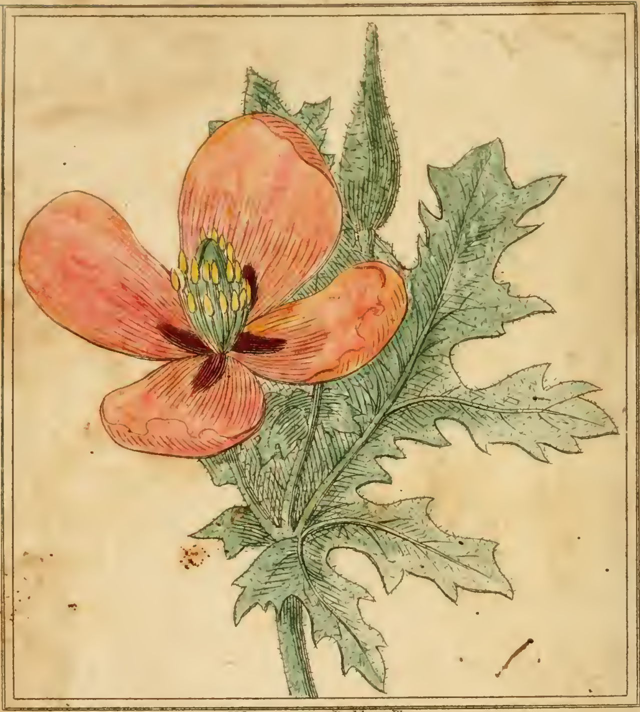
+QK45
.D85
v.1-2


THE NEW YORK BOTANICAL GARDEN
1891
PRO SCIENTIA POPULIQUE SALUTE
LIBRARY

RED HORNED-POPPY



H. Longmate sc. 51 Rathbone Place

The fructification is a temporary part of vegetables, deſtined for the reproduction of the species, terminating the old individual and beginning the new.

ELEMENTS

OF THE

SCIENCE OF BOTANY,

AS ESTABLISHED

BY LINNÆUS;

LIBRARY
NEW YORK

WITH

EXAMPLES TO ILLUSTRATE THE CLASSES AND
ORDERS OF HIS SYSTEM.

By Richard Duppa.

‘Knowledge is a defence, and giveth life to them that have it.’

VOL. I.

LONDON:
PRINTED BY T. BENSLEY, BOLT COURT,
FOR
J. MURRAY, FLEET STREET.

MDCCCIX.

+QK45
.D85
v.1-2

DEDICATION.

*To Mrs. N***.*

This little book is expressly made for your Amelia, under your direction, to awaken her mind to the contemplation of Nature.

The use of natural history, in general, is to enable us to distinguish one body from another, and to know their properties; and if Botany, which is one branch of it, had no other advantage than that of giving perspicuity and order to our thoughts, a moderate proportion of time in early life would be well employed in the pursuit. To facilitate this branch of knowledge, the celebrated Linnæus has artificially arranged the vegetable kingdom into twenty-four great divisions, or classes, of which I have given examples in each, accompanied with such amusing or illustrative facts as may serve to make the subject more interesting or impressive. In each class I have also given one plant, either a native of our own country, or such as is familiarly known, that the flowers may be referred to without inconvenience; for all knowledge, worth possessing, must be derived from the source, and be acquired by ourselves. Of the English plants, wild flowers have been preferred, that, in the pursuit of this delightful study, exercise and contemplation may be united; for it is in the country and in the fields that the heart is made better, though in great cities the wit may be improved. That my Niece may possess the advantages of both, is the sincere wish of

Your affectionate brother,

R. D.

INTRODUCTION.

All plants are supposed to be reproduced by seed; Linnæus, therefore, chose the parts necessary to that end as the basis of his artificial system of Botanical arrangement. By the flower and fruit, or parts of fructification, the species of each plant may be renewed for ever; all other modes of propagation, as by buds, grafts, or layers, seem to be only the extension of an individual, and sooner or later have their termination.

Linnæus distinguishes seven parts of fructification, which may be enumerated in the following order.

Calyx, or flower-cup, as seen in the green tubular part in the Clove-pink (Class X. *a*, *a*); this part in different flowers is various in shape and structure.[a] In some instances it is permanent till the seed is ripe, as in the Dead Nettle; in others it falls before the flower is well expanded, as in the Poppy; and some flowers appear to be wholly without it, as the Lily. The next part is called by botanists the Corolla, which in some plants is also wanting, as in the Pepper; it is white in the Privet, yellow in the Myrtle, and red in the Rose; and is commonly called the Flower.[b]

---

[a] The colour of the Calyx is usually green; nevertheless in some plants it is of other colours, as in the flowering Pomegranate it is scarlet, and in the elegant Fusia it is a bright crimson.

In the centre of the Corolla there are two parts on which the fructification and reproduction of the species more particularly depend: in plants of the liliacious kind they are remarkably conspicuous. They are named respectively, STAMEN and PISTILLUM. The Pistillum produces the seed at the base; and the use of the Stamen is to perfect that seed, so that it may have a principle of life to vegetate and reproduce other plants of the same kind.

The other three parts are, the seed, called, in the language of botany, SEMEN; the seed-vessel, or pod, called by the general name of PERICARPIUM; and the base of the flower, named RECEPTACULUM, which may be familiarly understood by that part called the bottom of the Artichoke: the fruit of the Strawberry is also a pulpy Receptaculum.

Thus they may be arranged, with their distinctive botanical names, Calyx, Corolla, Stamen, Pistillum, Semen, Pericarpium, Receptaculum.

Plate I. exhibits a Stamen and a Pistillum, each subdivided with their respective botanical names. The Pistillum into three parts, GERMEN, STYLE, STIGMA;

---

[b] The leaves that compose the Corolla are called Petals, and are usually of the colours, white, yellow, red, or blue, separate or combined; but sometimes they are green, as in the herb Paris; and the Green Hellebore exhibits a curious metamorphose, the Petals of which are first white, then green, and afterwards are changed into a Calyx.

of these parts, the Stigma, and the Germen which contains the embrio seed, are indispensable; but the Style is often wanting, as in the Poppy. The Stamen is divided into two parts, FILAMENT, ANTHERA; but that which is essential to the fertilizing the seed, is an apparently fine dust, or powder, contained in the Anthera, called POLLEN, which, by falling on the Stigma of the Pistillum, is the cause of complete fructification.

Many experiments have been made to ascertain the importance of the Stamina and Pistilla to the production and ripening perfect seed. In the middle of the last century, in a hot-house at Berlin, there was a Date Palm which blossomed very luxuriantly every year with flowers containing Pistilla only,[c] but never produced any seed or fruit that came to perfection. In a hot-house in Leipsic there was one of the same species that produced blossoms only with Stamina. In the year 1749, a branch of this tree in flower was sent from Leipsic to Berlin, and suspended over the Palm-tree there, that produced only Pistilla, and that year, for the first time, it bore perfect fruit and seed; some of which were sent to Linnæus in Sweden, who raised other trees from them at Upsal.

The importance of these two parts of a flower to the maturing the fruit of the Palm was known among the ancients, and the trees bearing flowers with Stamina only, were carefully planted among those that bore the Pistilla, that the Dates might come to perfection; and among the moderns, where this fruit is an article of food, it is now not less scrupulously attended to. M. Michaux, in his Travels in Persia, has observed, that in the contentions and civil commotions in that country for the dominion of the empire, the different parties which were alternately victorious, in order the more speedily to reduce the inhabitants of the provinces, burned all the Palm-trees that produced Stamina; and famine would have been the consequence had not the Persians previously taken the precaution to preserve a great quantity of the Pollen for the purpose of fructifying the fruit-bearing trees which produce only Pistilla. It also appears from the same author, that the Pollen, which had been preserved for this purpose, had been kept for eighteen years without losing its fertilizing property.

---

[c] This plant bears its Pistilla on one tree, and the Stamina on another.

To illustrate the importance of the Stamina and Pistilla, Linnæus made a decisive experiment on the Horned-Poppy, for which reason I have introduced that flower to face the title page.[d] From this plant he stripped off the Stamina from two separate flowers, and afterwards carried the Pollen of a third to one of these which he had so deprived of its Stamina: the seed of that Poppy came to maturity which he had so fertilized, and the other did not; the experiment was frequently repeated with the same result.

---

[d] The Red Horned-Poppy grows wild in sandy corn-fields; it blossoms in June and July, the flowers are very short-lived, often not exceeding half a day, yet produced in long succession. The botanical name is *Glaucium phœnicium.*

It is upon the knowledge of these principles of nature that our countryman, Mr. Andrew Knight, has been so successful in producing new apples, and varieties of leguminous vegetables. By taking the Pollen from one species and fertilizing the Pistilla of others of a different kind, but of the same natural Genus, he has produced a pea of a larger and finer sort than any we were before acquainted with.

The Stamina and Pistilla being demonstrated to be essential parts of a plant, Linnæus made them the basis of his system, which he divided into twenty four classes; twenty-three of which have their distinctions founded on the number, and situation or arrangement of the Stamina; and the twenty-fourth is made to include all those plants which, from the obscurity of their fructification, did not allow of being included in either of the preceding.

The first eleven classes depend entirely upon the number of the Stamina; as Class I. one Stamen; Class II. two Stamina; Class III. three Stamina, &c.

Class XII. depends upon the number, with the additional circumstance of their growing out of the Calix.

Class XIII. depends on the number, and their growing out of the Receptaculum.

Class XIV. and XV. depend on the relation of the Stamina among themselves. The first of these has four Stamina, two of which are long and two short; and the second has six Stamina, of which four are long and two short.

Class XVI. XVII. XVIII. depend upon the Stamina being more or less united, as in class sixteen all the Stamina are united together in one sheath; in class seventeen the Stamina are divided into two quantities; and, in class eighteen, into more than two.

Class XIX. has the upper part of the Stamina, usually the Antheræ, united into a tube, and the lower part or filaments separate.

Class XX. has the Stamina situated on the Pistillum. These seven classes are illustrated by plates prefixed to each class respectively.

Class XXI. comprehends those plants where the Stamina grow in separate flowers from those that produce the seed, yet both sorts of flowers growing at the same time on the same plant, as in the Cucumber.

Class XXII. includes those plants where the flowers that bear the Stamina grow on separate plants from those that produce the seed, as in the date-bearing Palm already mentioned.

Class XXIII. comprehends those plants the Stamina of which grow sometimes on separate plants, sometimes in separate flowers in the same plant, and sometimes in the same flower with the Pistilla.

Class XXIV. includes Ferns, Mosses, Liverworts, Flags, and various kinds of sea-weeds and fungi.

The Linnæan Names of these Classes are,

I. Monandria.
II. Diandria.
III. Triandria.
IV. Tetrandria.
V. Pentandria.
VI. Hexandria.
VII. Heptandria.
VIII. Octandria.
IX. Enneandria.
X. Decandria.
XI. Dodecandria.
XII. Icosandria.
XIII. Polyandria.
XIV. Didynamia.
XV. Tetradynamia.
XVI. Monadelphia.
XVII. Diadelphia.
XVIII. Polyadelphia.
XIX. Syngenesia.
XX. Gynandria.
XXI. Monoecia.
XXII. Dioecia.
XXIII. Polygamia.
XXIV. Cryptogamia.

Besides these divisions, Linnæus made a secondary artificial arrangement or subdivision of these Classes into Orders.

The Orders of the first thirteen Classes are established upon the number of the Pistilla or Stigmæ, and are shewn by a marginal reference in the letter-press accompanying each class.

The Orders of Class XIV. and XV. are characterized by the manner of producing their seed, as shewn in the two plates prefixed to those classes.

The Orders of Class XVI. XVII. and XVIII. are founded on the number of Stamina which compose them.

The Orders of Class XIX. are marked by the united or separated, barren, fertile, or abortive nature of the florets; and each is illustrated in its proper place.

The Orders of Class XX. XXI. and XXII. are almost entirely distinguished by the number of their Stamina.

The Orders of Class XXIII. are distinguished upon the principles of the two preceding classes, and being three, are called Monoecia, Dioecia, Trioecia.

The Orders of Class XXIV. are professedly natural, and in the Linnæan arrangement are four; Ferns, Mosses, Flags, and Fungi. In this class Dr. Smith has made five orders in his 'Introduction to Physiological and Systematical Botany,' a work highly to be recommended, as being the best elementary book on the subject, upon scientific and philosophic principles, in the English language.

At the top of each Plate is engraved the Class, Order, and English name of the plant; and underneath, the scientific or botanical name.

CLASS I.

ONE STAMEN.

This Class has two Orders.

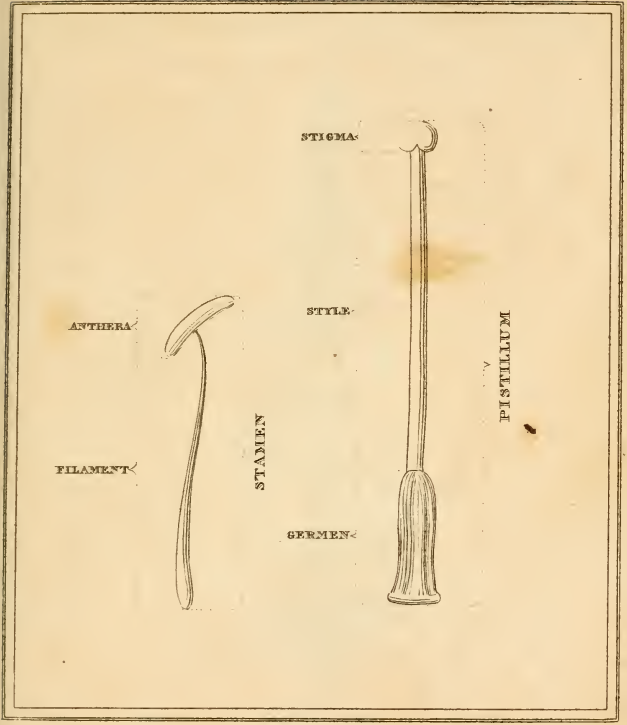
Order 1. One Pistillum

MARE'S-TAIL. This plant has only one Stamen and one Pistillum, and each flower produces only one seed. It is found in ditches and pools, and on the borders of slow streams; it is not very common, but grows in several parts of Norfolk, and in the neighbourhood of London. It blossoms in May and June.

Order 2. Two Pistilla.

WATER STAR-WORT is common in ditches and standing water, and blossoms from April to October; its upper leaves make a star-shaped appearance, from whence it has its name.

Plants in this class are not numerous, and there are none of English growth that have ornamental or conspicuous flowers. The Cane or Indian Reed bears a beautiful crimson blossom, and the wild Lopezia of Mexico is an elegant flowering plant; but I have preferred the humble growth of our own country, by Mr. Sowerby's kindness, who has permitted me to use his Indigenous Botany upon this occasion, which it is no flattery to say, is by far the most complete work of the kind ever published.

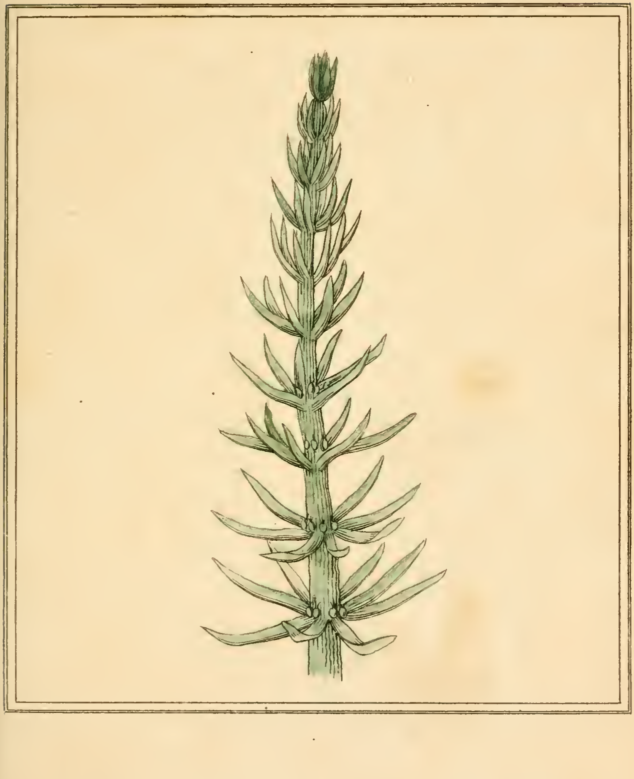


ESSENTIAL PARTS OF A PLANT

CLASS I

ORDER 1

MARES-TAIL



HIPPURIS VULGARIS

CLASS II.

TWO STAMINA.

This Class has three Orders.

Order 1.
One Pistillum.

ENCHANTER'S NIGHT-SHADE. This plant is so called, probably from its being found in shady damp places, in churchyards, where ghosts were supposed to haunt; and was therefore thought to be favourable to incantation. It blossoms in July and August; and the delicacy of the flower gives a ray of cheerfulness to the gloom of its natural situation.

Order 2.
Two Pistilla.

SWEET-SCENTED VERNAL GRASS blossoms in May and June. The fragrance of new-made hay is said to be principally produced by this grass; but the opinion, I believe, is not very well founded. This is the only English plant of this Order.

Order 3.
Three Pistilla

BLACK PEPPER. The different species of Pepper are very many. Professor Martyn enumerates sixty. They are all natives of the East and West Indies; a few in the islands of the South Seas, two or three of the Cape of Good Hope, but none of Europe.

Black Pepper is a shrubby plant, and grows spontaneously in the East Indies and Cochinchina. It is cultivated with such success in Malacca, Java, and especially in Sumatra, that it is from thence exported to every part of the world. It is exported also from Cochinchina.

White Pepper was formerly thought to be a different species from the Black; but it is nothing more than the ripe berries deprived of their skin by steeping them about a fortnight in water; after which they are dried in the sun. The berries falling to the ground when over-ripe lose their outer coat, and are sold as an inferior sort of White Pepper.

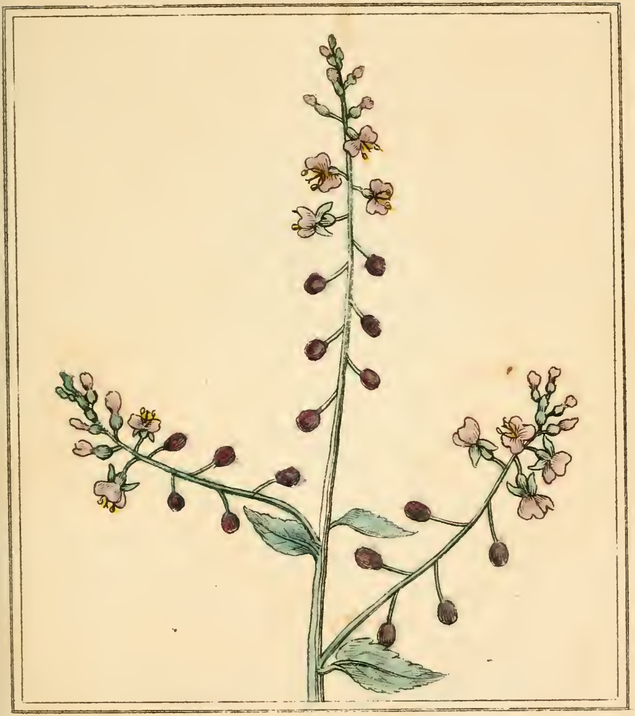
Black Pepper is the strongest and the hottest of them all; and is most commonly used for medical as well culinary purposes. That which is called Cayan Pepper is produced from a plant in the West Indies, of a very different genus, called *Capsicum*, of which there are five species; and that particular species from which the Cayan is made is *Capsicum minimum.*

There is no English plant of this Order.

CLASS II

ORDER 1

ENCHANTER'S NIGHTSHADE

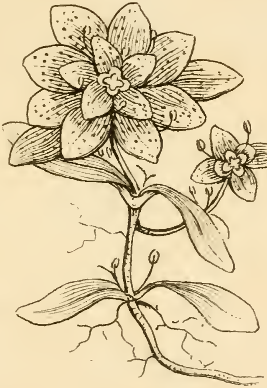


CIRCÆA LUTETIANA

CLASS I

ORDER 2

WATER STAR-WORT

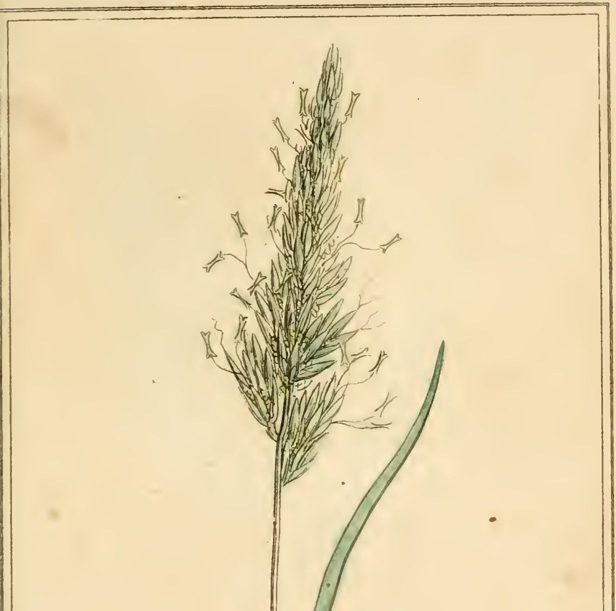


CALLITRICHE AQUATICA

CLASS II

ORDER 2

SWEET-SCENTED VERNAL-GRASS

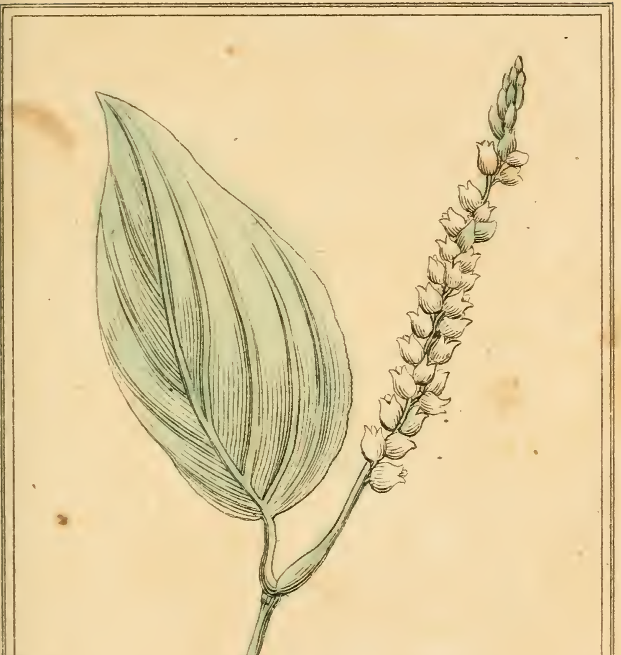


ANTHOXANTHUM ODERATUM

CLASS II

ORDER 3

BLACK PEPPER



PIPER NIGRUM

of sheep and goats, were used to write upon by the ancient Iönians some hundred years before this time, according to Herodotus; but it would seem that Eumenes invented a new mode of preparing them.

Paper made from the Papyrus was principally manufactured at Alexandria, from the exportation of which the city was greatly enriched; and in the time of the Emperor Adrian, Vospiscus speaks of one Fermies, who boasted that he could maintain an army with the value of his stock of paper.

When this paper became to be disused is not known with more accuracy than its commencement; and the truth is, probably, that they were both so gradual, that no fixed point of time existed for either. As late as the end of the fifth century it was in general use in Europe; and in Italy it was occasionally used till the eleventh, and in France till the twelfth century,[a] when paper made of cotton entirely superseded it. Afterwards paper made from linen was adopted, of which there is reason to believe none was entirely made of that material before the year 1367.

From *Papyrus, paper* is derived; and from the ancient custom of writing on the leaves of trees, our book is said to be composed of leaves. *Liber* is the inner bark of a tree, on which the ancients were also used to write; and *volumen* was the manuscript rolled up; hence our words *library* and *volume.*

---

[a] The Bulls of the Popes, Sergius II. John XIII. and Agrapatus II. were written in the eighth and ninth centuries on cotton paper

Order 2.
Two Pistilla.

CAT'S-TAIL GRASS blows from June to October, and is common to every meadow, but not profitable to the farmer. This grass has a fibrous root when growing in pastures that are uniformly moist; but in dry situations, or such as are only occasionally wet, it acquires a bulbous root, whose inner substance is moist and fleshy; exhibiting a curious instance of the provision of nature to guard the plant against too sudden a privation of moisture from the soil.

To this Class, with a very few exceptions, belong all that numerous Order of vegetables called Grasses, which support the countless tribes of graminivorous animals. The seeds of the smaller kinds are the sustenance of many birds; while the seeds of the larger grasses, as wheat, barley, rye, and oats, supply food for the human species.[b] Among these the wheat is of the most importance, which, in its native state, is a very small seed; but by culture it is enlarged, and the quantity infinitely increased. From a single grain, Mr. Charles Miller, of Cambridge, produced no less than three pecks and three quarters, weighing 47 pounds, by the following management: On the 8th of August he took up a plant of wheat which had been sown in the beginning of June, and divided it into eighteen parts, each of which was transplanted separately; about the latter end of September they were again removed, and divided into sixty-seven roots. In the end of the March following, and the beginning of April, they were separated into 500 plants, which yielded 21,109 ears; and thus this single grain produced 570,000 fold.

---

[b] The number of British grasses are very variously estimated by different authors; but Dr. Smith, who is most to be depended on, describes 113 species in his Flora Britannica.

The word grass conveys to the mind a description of plants more easily conceived than defined; yet perhaps they may be thus described, as plants which have commonly round, hollow jointed, unbranched, stems, with leaves very entire, and longer than they are broad; seed contained in chaffy husks, and when germinating, not parting in lobes or cotyledons.

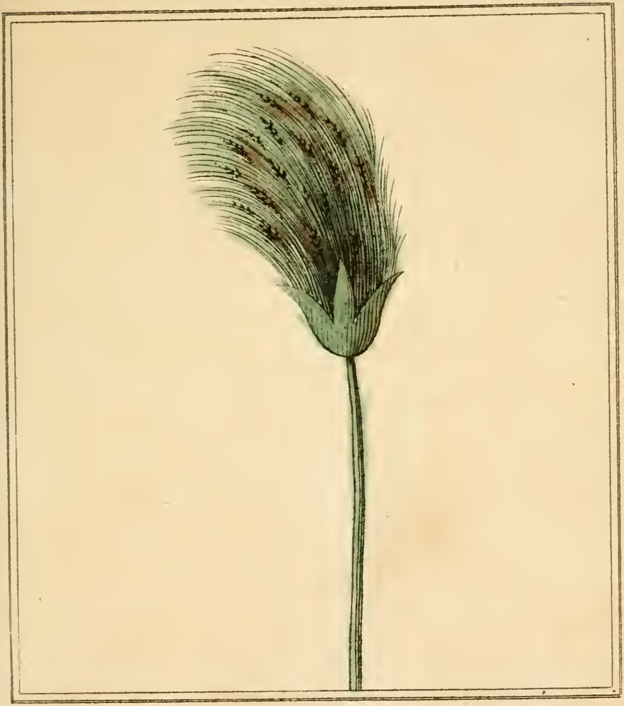
Order 3.
Three Pistilla.

UMBELLIFEROUS CHICK WEED. This is an annual plant, found wild in Norfolk and Suffolk, and blossoms in April and May. It was first noticed in England in 1765, when it was found on the walls of Norwich.

CLASS III

ORDER 1

PAPYRUS

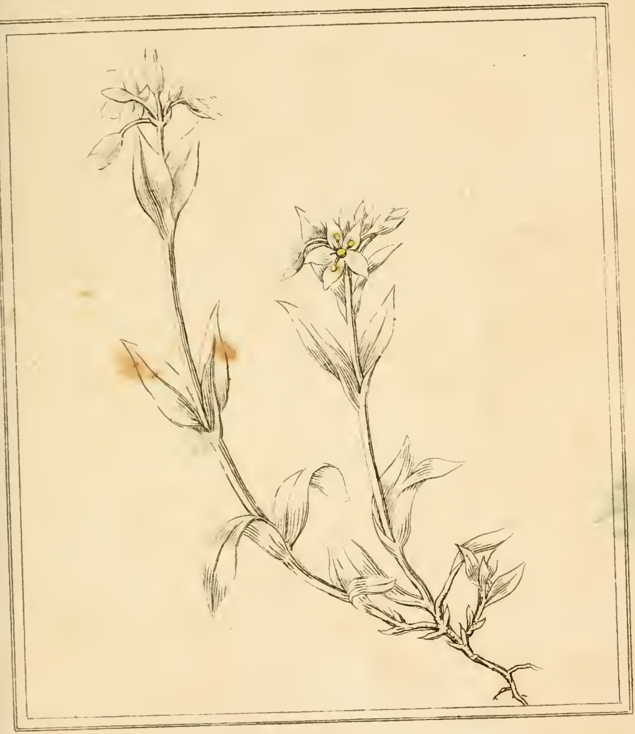


CYPERUS PAPYRUS

CLASS III

ORDER 3

UMBELLIFEROUS CHICK-WEED



HOLOSTEUM UMBELLATUM

CLASS IV.

FOUR STAMINA.

This Class has three Orders.

Order 1. One Pistillum

DEVIL'S-BIT SCABIOUS abounds in grassy pastures that are somewhat moist, and blossoms from August to October inclusively. This plant has an abrupt root, as if it were cut or bitten off; and from the notion that formerly prevailed as to the cause of this peculiarity, it was supposed to have great efficacy in medicine. Gerarde, in his Herbal, has given this whimsical account concerning it: "It is commonly called Morsus Diaboli, or Devil's bit, of the root (as it seemeth) that is bitten off: for the superstitious people hold opinion, that the Devil, for the envy that he beareth to mankind, bit it off, because it would be otherwise good for many uses."

Of this Class and Order is the Teasel, very curious in its structure, and important in our woollen manufactures, and the Madder which is cultivated in large quantities for dying red.

Order 2. Two Pistilla.

SLENDER BUFFONIA blossoms in May and June: it was first noticed in England by Ray. It was named by Sovage in honour of the Count de Buffon; and Linnæus added the epithet *tenuifolia*, appropriate to the plant, and at the same time expressive of the slender pretensions of the French naturalist to that honour. Unfortunately these two great men entertained but little respect for each other. In France Torniforte held the first place in the department of Botanical knowledge. Buffon himself was no botanist, but as a zoologist so extolled by his countrymen, that a statue was erected to him in his own lifetime, on whose pedestal was an inscription that declared HIS GENIUS EQUAL TO THE MAJESTY OF NATURE. For such a man, perhaps, Linnæus was born too far to the North! and for such admiration in his own country, he may have thought it not decorous to admire any talent out of it.

Linnæus named many genera of plants to commemorate persons who had added to the stock of botanical knowledge; and a strong feeling of his natural character is very discernible in this exercise of his judgment. One genus he named after a scholar of his, whose name was Browall, of obscure birth, and humble fortune, and called it Browallia *depressa*. Afterwards this same man, by a favourable change of circumstances, became a bishop, and in this rank he forgot his former condition, and his former friends; Linnæus then named another species of the same genus Browallia *elata*. A plant, which has its leaves in pairs, he named *Bauhinia*, in honour of two brothers, John and Gaspard Bauhins. The name of *Banisteria* he gave to a climbing plant, in remembrance of a M. Banister, who lost his life by falling from a rock, which he was climbing, in botanical pursuits.

Order 3.
Four Pistilla.

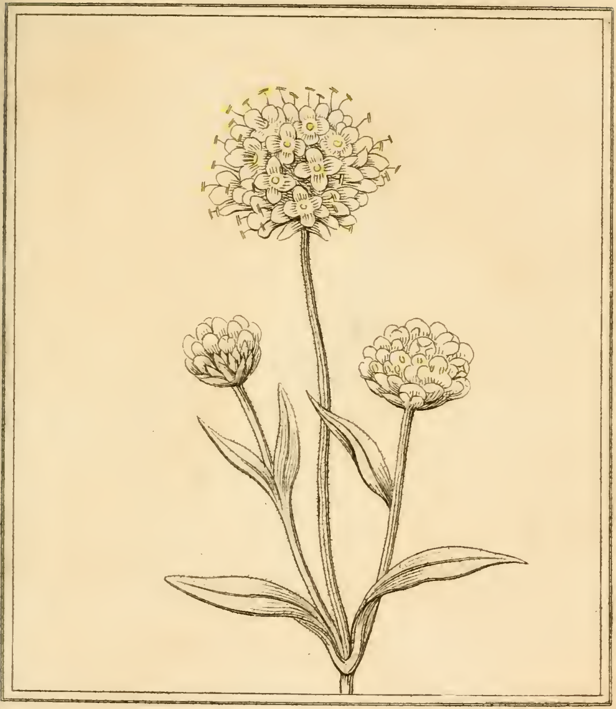
COMMON HOLLY blossoms in May, the berries ripen in autumn, and last throughout the winter. The Holly tree is of slow growth, and long duration; the wood is close-grained, and the bark smooth, and abounds in a mucilage of which bird-lime is made.

Branches of this tree were sent by the ancient Romans to their friends with their New-year's gifts, as emblematical of good wishes; and the custom is said to be nearly as ancient as the building of Rome itself. We decorate our houses and churches with it at Christmas, to give an air of spring to the depth of winter.

CLASS IV

ORDER 1

DEVIL'S-BIT SCABIOUS

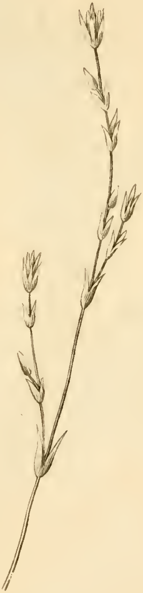


SCABIOSA SUCCISA

CLASS IV

ORDER 2

SLENDER BUFFONIA

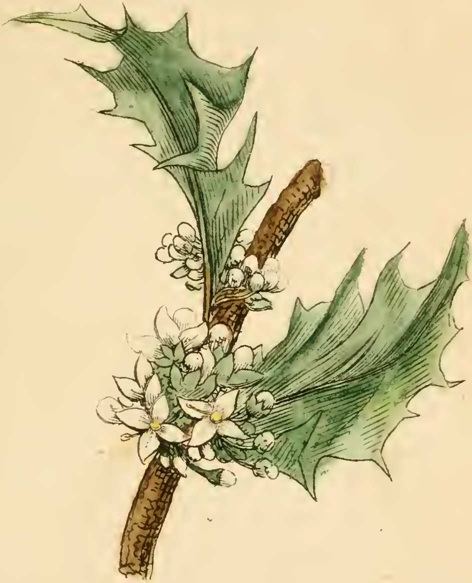


BUFFONIA TENUIFOLIA

CLASS IV

ORDER 3

COMMON HOLLY



ILEX AQUIFOLIUM

CLASS V.

FIVE STAMINA.

This Class has seven Orders.

Order 1. One Pistilum

SCARLET PIMPERNEL is common on sandy and gravelly soils, and blossoms throughout the whole summer; the flower opens only in fine weather, and invariably closes against rain; hence it is called the shepherd's weather-glass. Nevertheless, sudden thunder storms sometimes take it by surprise; the previous state of the atmosphere not having been such as to give it due warning.

It has been observed by Linnæus that flowers lose their fine sensibility either after the Antheræ have performed their office, or when deprived of them artificially; and Dr. Smith, who mentions this circumstance, does not doubt the fact: he further adds, that he has reason to think that during a long continuance of wet the sensibility of the Pimpernel is sometimes exhausted.

Few flowers possess a greater delicacy of structure than this little plant; the edge of each petal, which, to a common observer, is terminated with a hairy appearance, when viewed with close attention, consists of little globular glands, each supported on a footstalk; making an appearance through a microscope like the balls on an earl's coronet. The filaments that support the antheræ are hairy, and each hair is curiously and regularly jointed.

Amid the various colours of flowers, yellow is the most common, and scarlet the most rare; and the Pimpernel and the red Poppy are the only English scarlet flowers that I am acquainted with. The Pimpernel, however, is sometimes white, and sometimes of a bright blue, tinged with purple; but these varieties are not common.

The Peruvian Bark tree is of this Class and Order. The discovery of its efficacies are thus described by Dr. Darwin: " Several of these trees were felled for other purposes into a lake, when an epidemic fever of a very mortal kind prevailed at Loxa, in Peru, and the woodmen accidentally drinking the water were cured; and thus were discovered the virtues of this famous drug." Coffee and Tobacco are both of this Order.

Order 2.
Two Pistilla.

WATER HEMLOCK grows in ditches, and the margins of rivers, always under water when young, in which situation horned cattle sometimes eat it by mistake, and are poisoned; it is also poisonous to the canine species and to man, but horses, hogs, and goats, eat it without danger. At Tornoa, in Lapland, a fatal disease prevailed among the cattle when Linnæus was making a botanical tour through that country, the cause of which was wholly unknown to the farmers; but this great naturalist immediately discovered the disease to be produced by this plant being eaten in marshy pasturage while in its young state under water, and unperceived by the cattle: he therefore recommended them to keep their cattle on upland grounds till the season of the year was sufficiently advanced to make the pasturage sound and dry; for when the plant is distinctly obvious it is always rejected by those animals to whom it may be hurtful. The farmers took his advice, and the evil was removed. This is an illustrious instance to demonstrate the advantage a scientific man has over plodding ignorance; and may even serve to shew the mean part of the creation, who see no value in any thing but what they can immediately convert into money, that even a little intellect in natural history may contribute to their views of human happiness.

Order 3.
Three Pistilla.

PASSION-FLOWER. Of this genus there are no less than thirty-seven different species. This is the common blue Passion-flower, which in a few years may be trained up to more than forty feet high, and the stalks will grow to a very considerable size. It grows naturally in Brazil, but is hardy enough to thrive here in the open air, and is now become the most common species in England.

This beautiful tribe of plants was unknown till the discovery of America, and the different species are chiefly found in South America and the islands. It has its name from a fanciful analogy of the different parts of the flower to the Passion of Christ. The Jesuits, who went as missionaries to South America, thought they discovered in the three pistilla the representation of the three nails with which our Saviour was nailed to the Cross; the five stamina the five wounds; and in the radiant purple Nectary the representation of the rays that might be supposed to have surrounded his head when he expired on the Cross.

Order 4.
Four Pistilla.

GRASS OF PARNASSUS. Of this plant there is only this one species; and it is the only English plant of this Order. It is a native of most parts of Europe, by the side of bogs and moors, and in wet meadows. It produces milk-white flowers in August and September. The petals are curiously veined with pellucid lines; but that part of the flower which is called the nectary, of which there are five, set round with numerous yellow glands, supported on foot-stalks, is more elaborately constructed than is to be found in any other British vegetable.

Order 5.
Five Pistilla.

FLAX blossoms in June and July; whether it be a native of England, or not, is doubtful.

Flax appears to have been cultivated as early as we have any historical knowledge: it is mentioned in the Old Testament as cultivated in Egypt.[c] It is a tall, slender, annual plant, with a beautiful blue flower. When it is ripe, it is pulled up by the roots by hand, laid in water to soak till it begins to rot; it is then taken out, spread in the air to dry, and is fit for the operation of breaking, &c.; after which it is spun,

[c] Exodus ch. ix. v. 31.

and by the loom made into cloth, from the coarsest sheeting to the finest cambric. From this plant I have seen thread so fine, as to be nearly worth its weight in gold, to be afterwards manufactured into lace. Thus by industry and ingenuity a simple vegetable is converted to one of the most ornamental and expensive luxuries of dress.

Flax not only supplies us with that cloth called *linen,* a word derived from *Linum,* the classical name of the plant, but the seeds furnish an oil, called linseed oil, of great importance in painting and varnishing; and after the oil is expressed from them, the refuse, called oil-cake, is applied to the fattening of cattle, a food profitable to the farmer, but injurious to the flavour of the meat.[d]

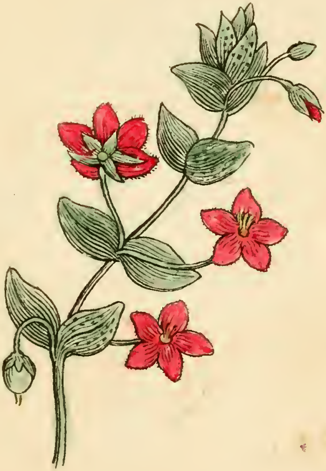
---

[d] In the simplicity of former times, when families in this island provided within themselves most of the necessaries and conveniencies of life, every garden supplied a proper quantity of hemp and flax for domestic use. The necessary preparation of steeping it in water, previous to dressing it, was so offensive and detrimental, that in the reign of Henry VIII. a law was made to prevent any person from watering hemp or flax in any stream, river, or common pond, where beasts where accustomed to drink, on pain of forfeiting, for every time, twenty shillings; and this law is still in force.

CLASS V

ORDER I

SCARLET PIMPERNEL

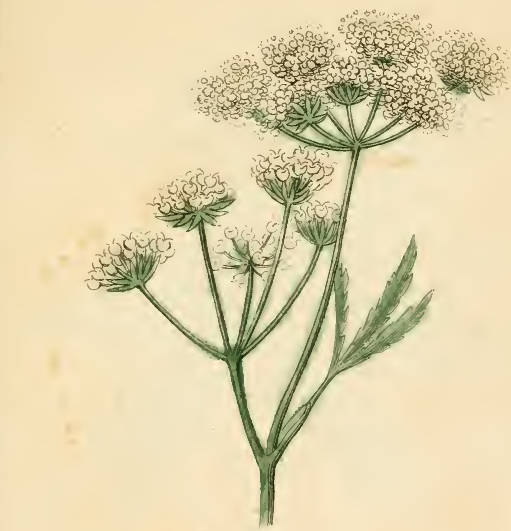


ANAGALLIS ARVENSIS

CLASS V

ORDER 2

WATER HEMLOCK

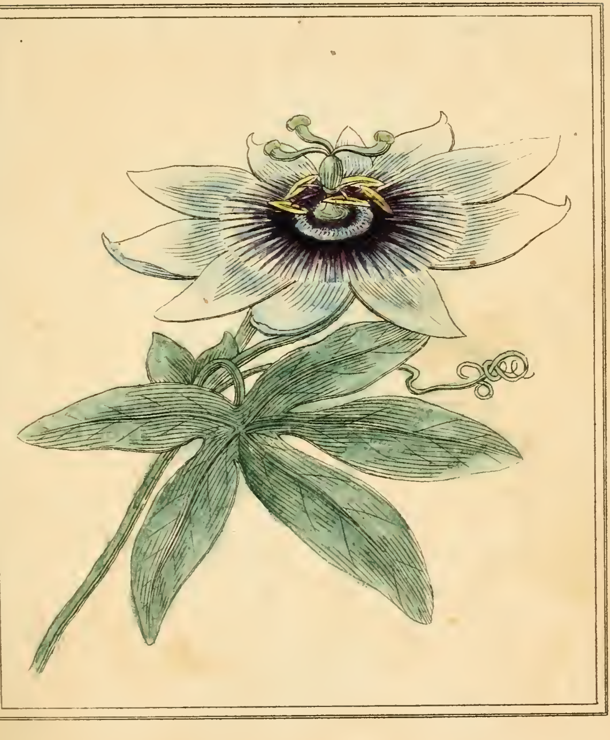


CICUTA VIROSA

CLASS V

ORDER 3

BLUE PASSION FLOWER

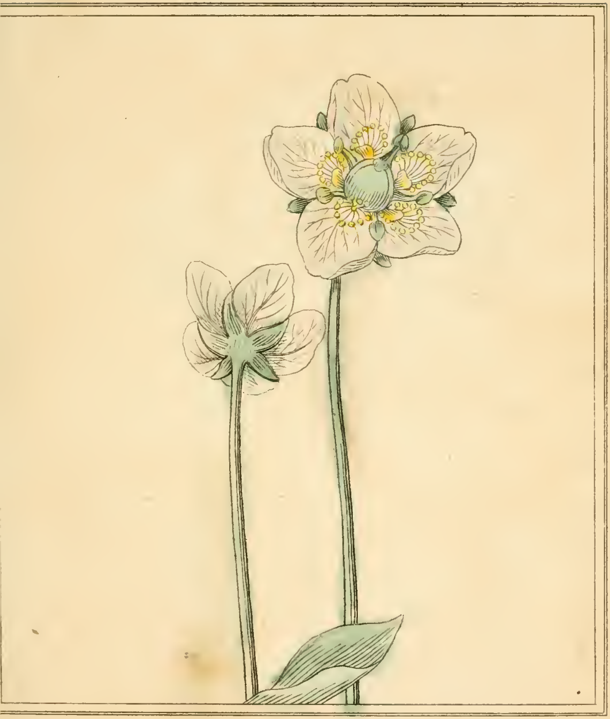


PASSIFLORA CÆRULEA

CLASS V

ORDER 4

GRASS OF PARNASSUS

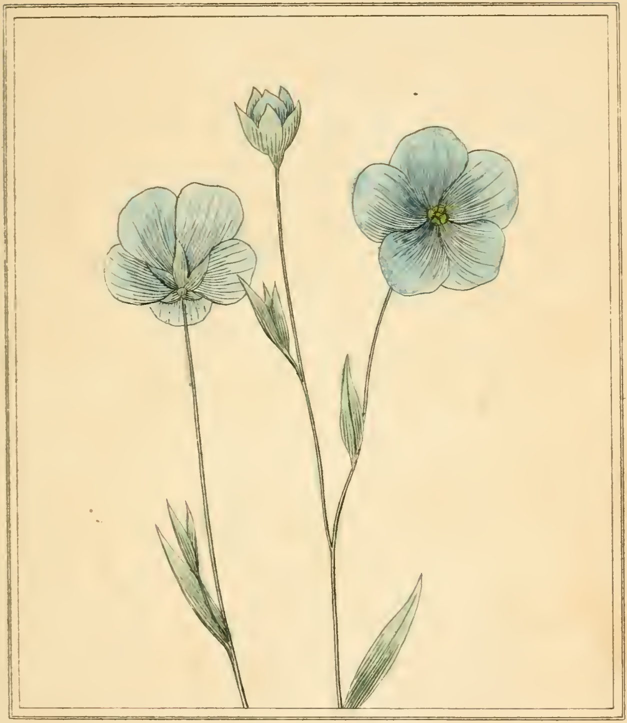


PARNASSIA PALUSTRIS

CLASS V

ORDER 5

FLAX



LINUM USITATISSIMUM

CLASS VI.

SIX STAMINA.

This Class has six Orders.

Order 1.
One Pistillum.

BARBERRY. This shrub is common in hedges, flowering in June, and bearing bright, red, pendulous berries in Autumn.

This plant is highly interesting from the peculiar property of the stamina of its blossoms; they exhibit, perhaps, the most remarkable instance of irritability that is known in vegetable life. If the filaments, when lying under the petals of the flower, are touched at the base in the slightest degree, they immediately spring, and embrace the pistillum: a fact extremely curious, and the obvious solution of its use is, that when insects go in search of honey, secreted in glands at the base of each petal, this irritability is excited to scatter the pollen upon the stigma, that the seed might be properly fertilized: but so imperfect is our knowledge of the agency of Nature, that no sooner are we satisfied with this rational solution, but we find another fact that destroys our theory, for in the *Cistus Helianthemum,* the stamina in their natural position closely surround the pistillum; but when touched they all recede from it. Here the naturalist is puzzled to account for the use of this property; but the obvious conclusion is, without giving ourselves much trouble, that we know nothing of ultimate causes:

It is commonly said, that the Barberry tree prevents the ears of corn in its neighbourhood from being productive. This opinion prevails as well on the continent as in England. Whether there be any truth in it I am not able to say, it is very generally believed; and therefore, however improbable, it ought not to be hastily rejected; but M. Broussonet, a celebrated French naturalist, who has paid particular attention to whatever is connected with agriculture, has asserted, that it is a prejudice void of foundation.

Order 2.
Two Pistilla.

RICE. The native place of Rice, like the other sorts of grain in common use, is unknown; Linnæus has made it a native of Ethiopia, but has not given his reason for this opinion. It is cultivated in great abundance all over India, where the country will admit of being flooded; in the southern provinces of China, in Cochinchina, Cambodia, Siam, Japan, &c. In Japan it is very white, and of the best quality.

In the hilly parts of Java, and in many of the eastern islands, rice is planted upon the sides of hills, which can be only watered by rain; it is, however, planted at the beginning of the rainy, and reaped in the beginning of the dry season; and is called by the natives *Paddy Gunung*, which signifies Mountain Rice. In the western part of India this kind is entirely unknown. It is however well known in Cochinchina, where it thrives in dry light soils, mostly on the sides of hills; not requiring more moisture than the usual rains and dews supply, neither being frequent at the season of vegetation.

Of this genus there is but one species; but the varieties of rice, as of other cultivated grain, are innumerable.

There is no English plant of this Order.

Order 3.
Three Pistilla.

MEADOW SAFFRON is produced in great plenty at Abberly, in Worcestershire, and various parts of England. It exhibits a mode of fructification scarcely to be paralleled among British plants. The flowers appear very late in the autumn; the germen afterwards remains latent underground, quite close to its bulbous root, till the following spring, when the seed-vessels rise above the surface, with several long upright leaves, and the seeds are ripened about June; so that at first sight the seed would seem to be ripened before the flower was produced; but on more accurate investigation, it is found to conform, in common with other plants, to the established laws of nature, though in a manner unexpected, and almost peculiar to itself. The juice of the root is so acrid, as to produce violent effects on the human constitution; this quality also prevents it from being eaten by subterranean insects; and thus the seed vessel is guarded during the winter.

Linnæus observes, that the defoliation of deciduous trees is announced by the flowering of the Meadow-Saffron; of these, the Ash is the last that puts forth its leaves, and the first that loses them.

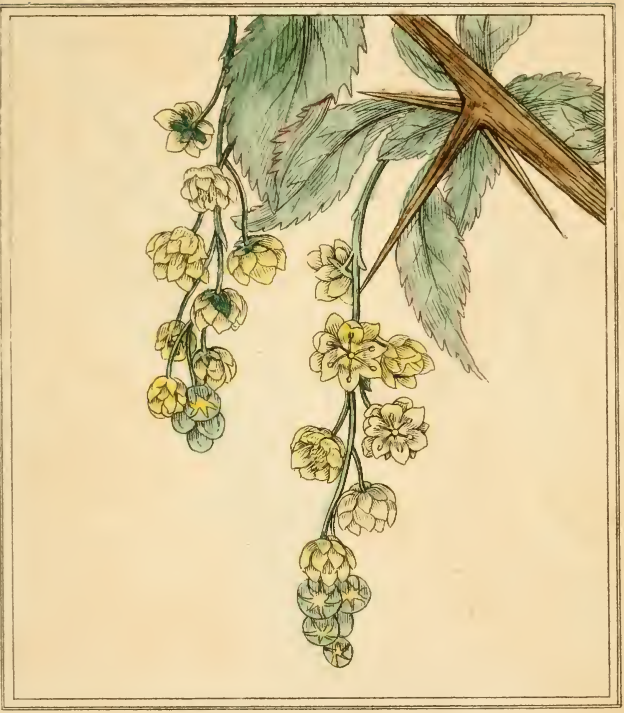
Order 4.
Four Pistilla.

PETIVERIA. It is a shrubby plant, common in the low lands in Jamaica, and in most of the islands in the West Indies, where it thrives most in a dry, gravelly soil, in shady situations. It has the property of enduring much drought, and remains green when other vegetation is burnt up; the cattle then feed upon it, and it gives their milk the taste of garlic. In this country it blossoms in June.

CLASS VI

ORDER 1

COMMON BARBERRY

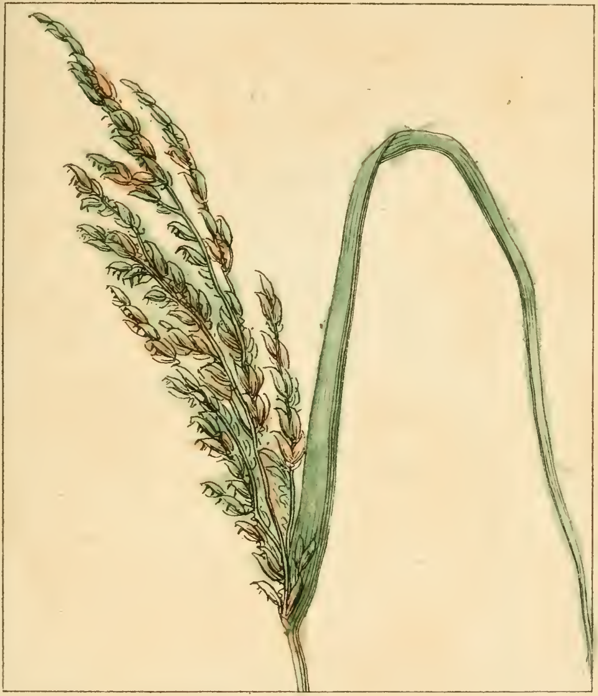


BERBERIS VULGARIS

CLASS VI

ORDER 2

RICE

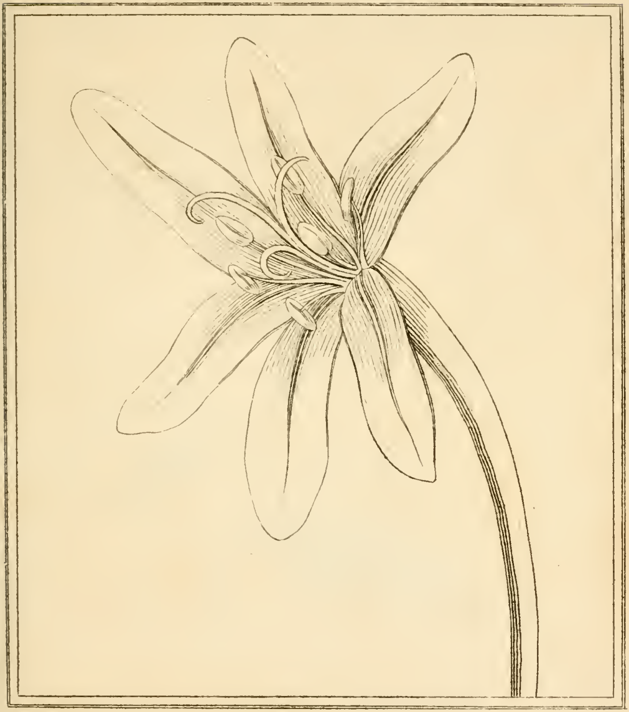


ORYZA

CLASS VI

ORDER 3

MEADOW SAFFRON

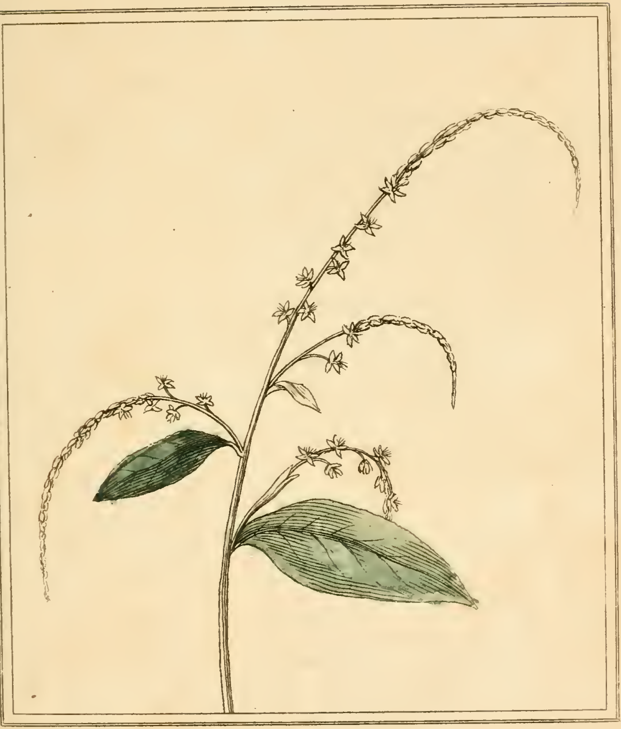


COLCHICUM AUTUMNALE

CLASS VI

ORDER 4

PETIVERIA



PETIVERIA ALLIACEA

CLASS VII.

SEVEN STAMINA.

This Class has four Orders.

Order 1.
One Pistillum.

CHICK-WEED WINTER-GREEN, is found in dry woods and turfy heaths in the north of England, but more particularly in Scotland. It is a plant chiefly confined to the most northern regions. I have, however, seen it grow very flourishingly in a garden at Clapham.

Linnæus was exceedingly delighted when he discovered it in his Lapland tour, probably from its being the only Lapland genus of the seventh class serving to complete the uniformity of his system. This is a very small class, and this Chick-weed is the only indigenous plant we have in it. The Horse-chesnut tree is also of this class; though now common throughout England, is a native of Mount Pindus, in Greece.

Of the second order of this class, which has two Stamina, there is no figure extant.

Order 3.
Four Pistilla.

LIZARD'S TAIL. This plant is a native of Virginia; it is perennial, generally trailing, and seldom rising more than two feet high. It blossoms in July, but does not produce seed in England. The stalk decays in the autumn.

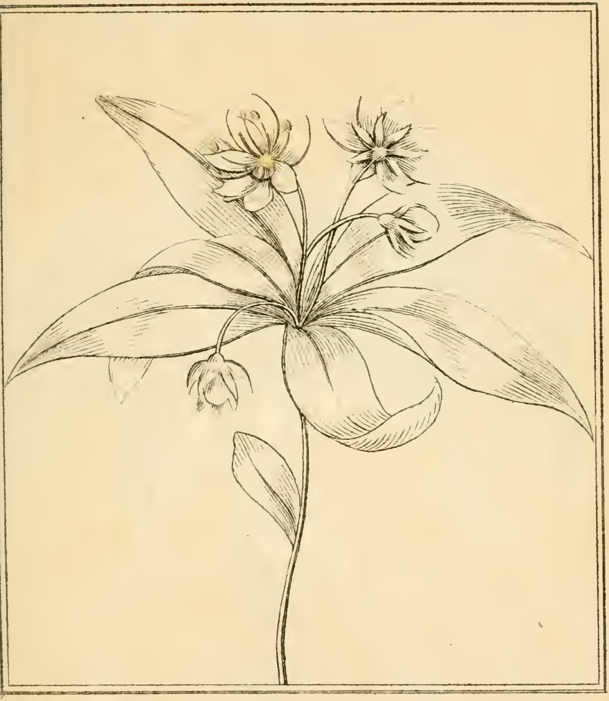
Order 4. Seven Pistilla.

ROUND-LEAVED SEPTAS is a native of the Cape of Good hope; it is a perennial plant, and blossoms in August and September; it was first brought to England in 1774. According to Linnæus it is reremarkable for the number seven; having the calyx in seven deep segments, seven petals, seven germens, and consequently seven capsules. The English trivial name *Round-leaved,* is from the general character of the leaves at the bottom of the flower-stem, which there was no room to introduce in the annexed figure.

CLASS VII

ORDER 1

CHICK-WEED WINTER-GREEN

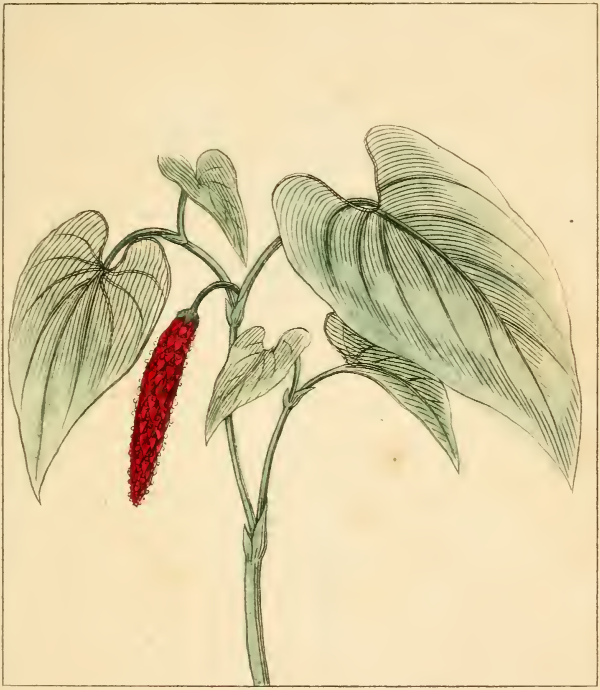


TRIENTALIS EUROPÆA

CLASS VII

ORDER 3

LIZARD'S TAIL

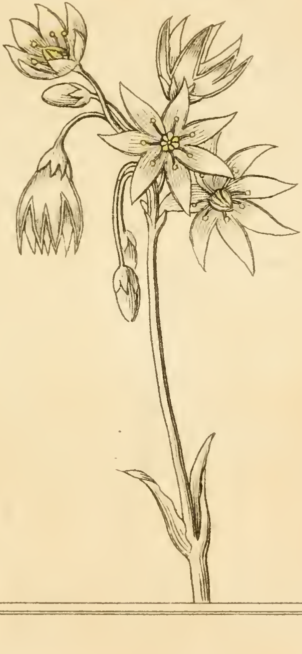


SAURURUS CERNUUS

CLASS VII

ORDER 4

ROUND-LEAVED SEPTAS



SEPTAS CAPENSIS

CLASS VIII.

EIGHT STAMINA.

This Class has four Orders.

Order 1.
One Pistillum.

NASTURTIUM is a native of Peru, and is said, by Linnæus, to have been first brought into Europe in the year 1684. It begins to blossom in July, and continues till the approach of winter.

The flowers, in the month of June and July, emit sparks or flashes in the morning before sun rise, and also during twilight in the evening, but not afterwards in total darkness. This curious phenomenon was discovered by a daughter of Linnæus, who first shewed it to her father, and to M. Wilcke, a celebrated electrician, who believed the scintillations to be electric.

Of this class and order is the numerous and beautiful tribe of plants called Heaths, which, for the most part, are natives of the Cape of Good Hope. Not one is known to be indigenous to the vast continent of America; nor, as far as we know, are any produced in China or New Holland.

Order 2.
Two Pistilla.

UPRIGHT GALENIA. This plant was named by Linnæus to commemorate the celebrated physician Galen, who flourished in the second century. It is a shrubby plant, a native of the Cape of Good Hope, and flowers from June to August.

There is no English plant of this order.

Order 3.
Three Pistilla.

CLIMBING BUCK-WHEAT is commonly known by the name of Black Bind-weed, probably from the dark colour of its seeds. It is a very common plant among corn and in garden hedges, and blossoms from June to September; its stem twists round every thing in its way.

A plant that grows with a twining and spiral stem invariably turns in the same direction. The Kidney-bean and the Convolvulus turn with the apparent motion of the sun, while the Hop and the Honey-suckle take a contrary direction, and any act that can be employed to change this law of nature is injurious to the plant, and, if persevered in, destructive. The Marsh-mallow-leaved Hermannia is a curious instance of two flowers growing on the same stem which have a spiral character, but which are invariably twisted in opposite directions to each other.

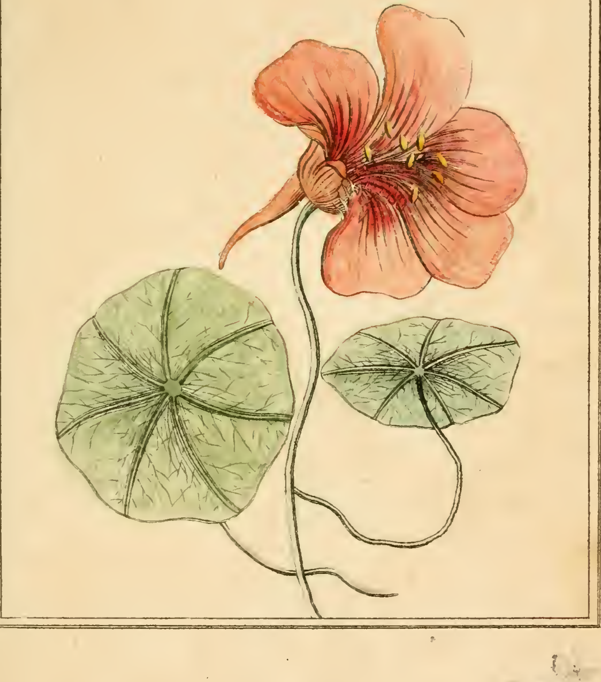
Order 4.
Four Pistilla.

TUBEROUS MOSCHATEL. This curious plant, of which there is but this one species, has been found wild in many parts of the kingdom, and at Bockleton, in Worcestershire, by Miss M. It blossoms at the end of March, or the beginning of April, and the berries ripen in May, soon after which the leaves decay. These and the flowers smell like musk, from whence it has been sometimes called Musk Crow-foot.

CLASS VIII

ORDER 1

NASTURTIUM

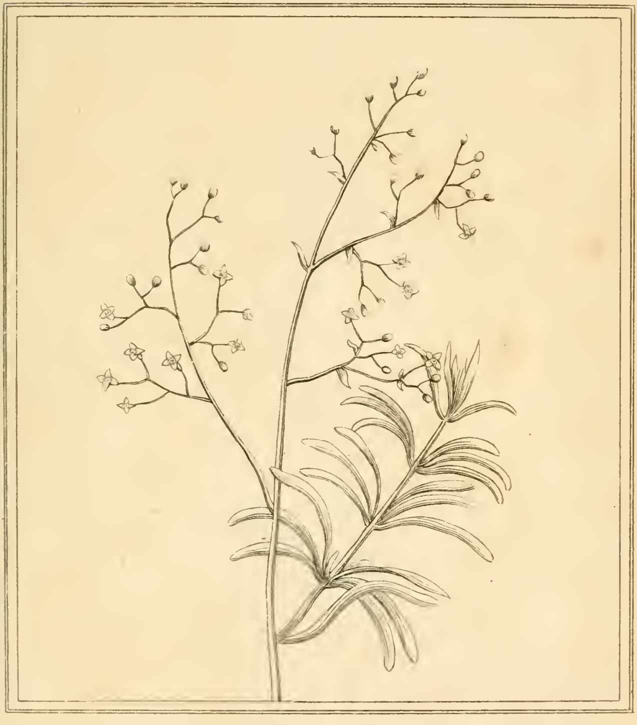


TROPÆOLUM MAJUS

CLASS VIII

ORDER 2

UPRIGHT GALENIA

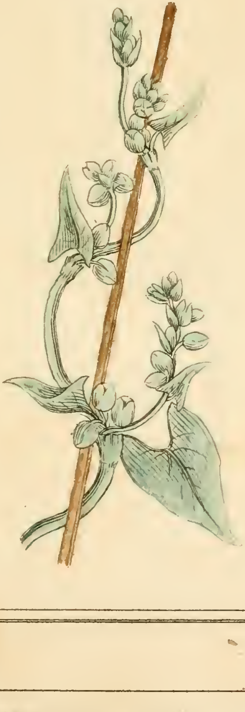


GALENIA AFRICANA

CLASS VIII

ORDER 3

CLIMBING BUCK-WHEAT

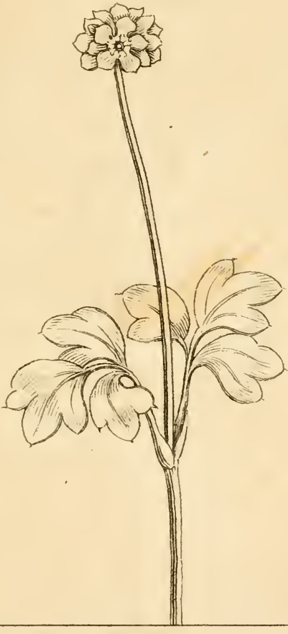


POLYGONUM CONVOLVULUS

CLASS VIII

ORDER 4

TUBEROUS MOSCHATEL



ADOXA MOSCHATELLINA

CLASS IX.

NINE STAMINA.

This Class has three Orders.

Order 1.
One Pistillum.

CINNAMON. The best sort of Cinnamon grows in great plenty in the Island of Ceylon, and is called by the natives, *Rasse Coronde*; besides which, there are many inferior sorts. It is the inner bark of this tree, which, in the language of botany, is called the *Liber*, that is used as a grateful aromatic spice.

The bark of the Cinnamon, while on the tree, is first stripped of its outer greenish coat, and is then cut longitudinally from the tree, and dried in the sand till it becomes fit for the market, when it is of a reddish yellow, or pale rusty-iron colour, very light, thin, and by the heat of the sun curled up in quills or flakes. The outer part of the bark, when taken off from the tree, differs very little in taste from that of other trees; but after being dried in the sun, the oily and agreeable sweetness of the inner bark is diffused through the whole. If the trees are more than fifteen or sixteen years old, the bark by degrees loses its aromatic quality, and has more the taste of Camphor. When the bark is stripped off, the tree is cut down, and new shoots put forth from the stool, which, from five to eight years, are again fit to peel.

The use of the Cinnamon-tree is not confined to the bark; the leaves, fruit, and root, all yield oils of different qualities, and of considerable value. That produced from the leaves is called Oil of Cloves; that from the fruit is extremely fragrant, and of a thick consistence, and at Ceylon is said to be made into candles for the sole use of the king. The bark from the root of the tree not only affords an aromatic oil, which has been called oil of Camphor, but also a species of Camphor which is purer and whiter than common Camphor.

The Cinnamon-tree is also cultivated in the islands in the West Indies.

Order 2.
Three Pistilla.

RHUBARB. This plant is a native of Tartary and China, near to the great wall. It blossoms in April and May. Of this genus there are seven species, but the root of the *Rheum Palmatum* is the drug that is sold in the shops.

It was first introduced into England in 1734; but it was not till many years afterwards that it was unequivocally known to be the medicinal Rhubarb as imported from Russia and the East. This plant is an example of remarkably quick vegetation; the stem of it, in three months, has been known to grow upwards of eleven feet, and some of the leaves to five feet in their longest extent. The root, which remains in the ground during the winter, grows also to a very large size; some have been produced in this country, of five years old, that have weighed more than seventy pounds in their fresh state.

From the best experiments that have been made upon the British Rhubarb, it appears to be of the same medicinal quality with that which is imported; but not quite so active in its operation, which is supposed to be owing to some want of skill or knowledge in curing it.

In the month of April the tender foot-stalks of the leaves of this plant are used in pastry as a substitute for green gooseberries, which, as is said by a sententious author, while it pleases the palate with novelty may be tolerated, but nobody eats Rhubarb tart twice.

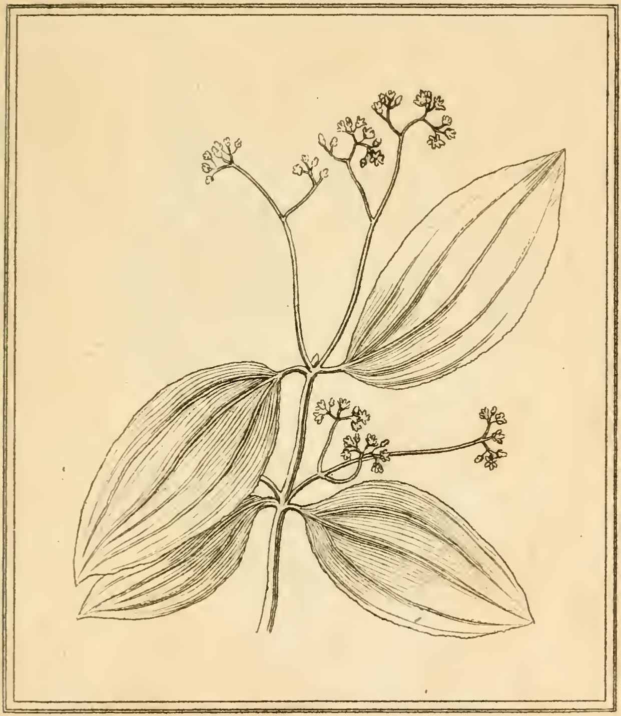
Order 3.
Six Pistilla.

FLOWERING RUSH, is the only British plant of the ninth class in the Linnæan System; it grows in ditches, and on the margins of rivers and ponds, chiefly in a gravelly soil, and blosoms in July. Like several of our aquatic flowers, it may be reckoned amongst the most ornamental. It is sufficiently hardy to bear the cold of Lapland.

CLASS IX

ORDER 1

CINNAMON

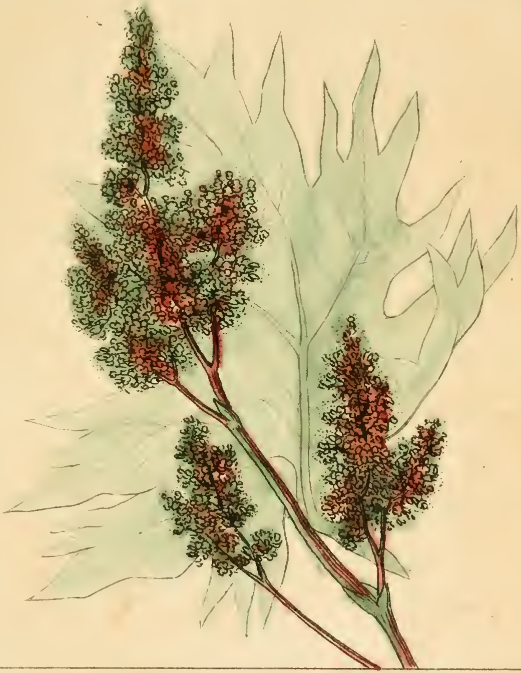


LAURUS CINNAMOMUM

CLASS IX

ORDER 2

RHUBARB

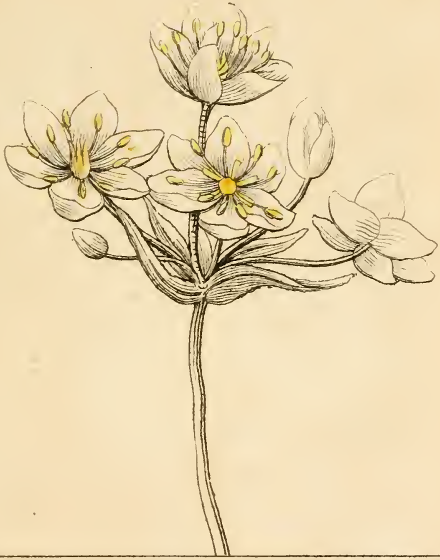


RHEUM PALMATUM

CLASS IX

ORDER 3

FLOWERING RUSH



BUTOMUS UMBELLATUS

CLASS X.

TEN STAMINA.

This Class has five Orders.

Order I. One Pistillum.

FLY-TRAP OF VENUS. This plant is a native of America, and exhibits a very curious instance of vegetable irritability: the leaves which are at the bottom of the foot-stalk are each divided into two lobes at the extremity, having long teeth on the margin like the antennæ of insects, and within armed with six spines, three on each side, and lie spread upon the ground round the stem, and are so irritable, that when a fly happens to light upon a leaf, it immediately folds up and crushes it to death.

Dr. Darwin, speaking of this plant, says, ‘I saw it on this day (Aug. 20, 1768), in the collection of Sir B. Boothby, of Ashburn-Hall, Derbyshire, and on drawing a straw along the middle of the rib of the leaves as they lay upon the ground round the stem, each of them, in about a second of time, closed and doubled up, crossing the thorns over the opposite edge of the leaf, like the teeth of a spring rat-trap.’

Mr. Knight, lately Mr. Hibberts's gardener at Clapham, now a nursery-man in the King's Road, made an experiment of supplying this irritability with fine filaments of raw beef, and that plant was more luxuriant than any other; it seems therefore probable that the decomposition of animal matter is peculiarly favourable to its economy, and the peculiar structure of its leaves may be designed to supply it with insects whose putrescence may act as similar decompositions do when applied to the roots of other plants, and the innumerable insects that are drowned in the cup-formed leaves of the Dipsacus Sarracenia and Nepenthes may probably serve for the same purpose.

To this class and order belongs the *Styrax officinalis*, which produces the gum storax. The flower has no scent, and the gum does not exude from the tree naturally, as in the Fir and Cherry-tree; but is produced by means of an insect which perforates the tree to lay its eggs, and the gum exudes out, presenting a curious instance of the agency of nature. This tree grows wild at Tivoly, near Rome, where I have seen it, as if it were a native; but it was first brought there by the Emperor Adrian from the east, when he built his magnificent villa, and I saw it with interest, as being still a living vestige of the existence of that Emperor who lived when Rome was in the zenith of her glory and mistress of the world.

Order 2.
Two Pistil'a.

CLOVE PINK. The botanical name given to this plant by Linnæus, would seem to shew that it was a favourite with him: Dianthus meaning the Flower of Jove. Ray and Hudson are of opinion that this plant is not a native of this country; but my friend, the learned Rector of Abberly, from repeated observation and experience, is confident that it must be indigenous; I therefore adopt his opinion with the same implicit respect, as I have upon all occasions for his judgment.

To this class and order belong the Saxifraga, an Alpine genus, remarkable for growing and thriving well in the smoke of London, and better than most other plants, though their native soil and climate are on the tops of the highest mountains: that which is called *London-pride,* is a good illustration of this fact.

Order 3.
Three Pistilla.

CORN CATCHFLY. This plant is a native of Kent, and not known to be a native of any other part of Britain; it is an annual, blossoms in July, and thrives most in a barren sandy soil. In the evening it emits a sweet smell, like that of a honey-suckle, but weaker.

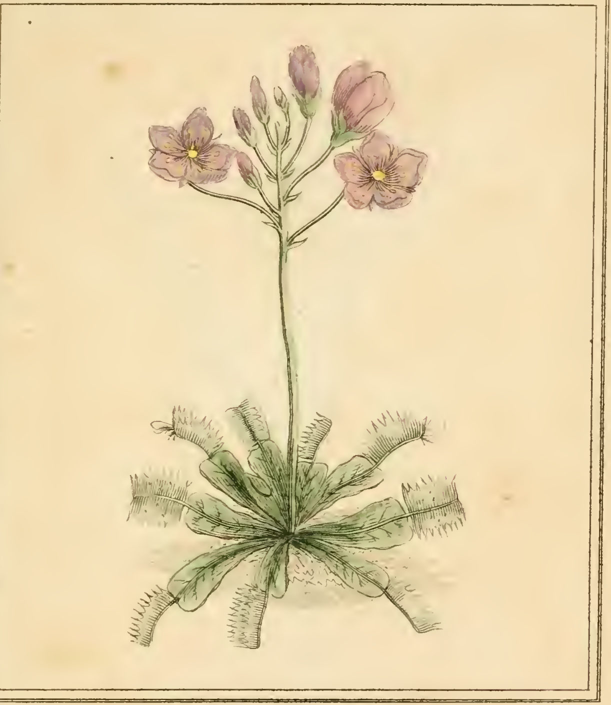
The Night-flowering Catchfly is another species of this genus; it has cream coloured petals tinged with red, which roll themselves up during the day, and unfold in the evening while warm weather continues, and, like the Corn Catchfly, are sweet scented.

These plants are, as the Nightingales among the feathered tribe, unattractive in their appearance, and, when nature has retired to rest, cheer the peaceful stillness of the dark.

CLASS X

ORDER 1

FLY-TRAP OF VENUS

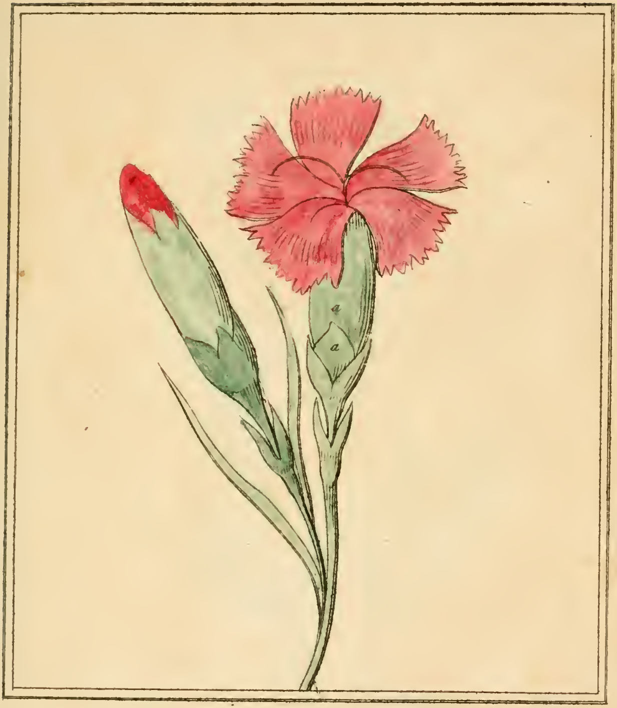


DIONÆA MUSCIPULA

CLASS X

ORDER 2

CLOVE PINK

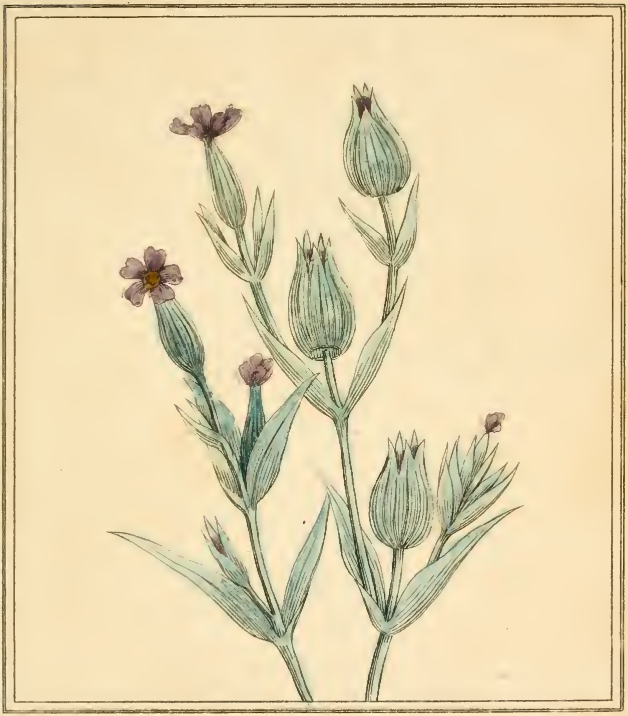


DIANTHUS CARYOPHYLLUS

CLASS X

ORDER 3

CORN CATCH-FLY



SILENE CONICA

CLASS XI.

TWELVE STAMINA.

This Class has six Orders.

This Class is called, in botanical language, by a name (*Dodecandria*) which supposes the plants to have twelve stamina; but the exact number twelve is so uncommon, that no plant has been found to have that number with unvarying precision, therefore this Class has been made to include such as may be found to have from eleven to sixteen stamina, and in some cases more, though in no instance to exceed nineteen.

PURPLE LOOSE-STRIFE grows on the banks of rivers, ponds, and ditches, and blossoms in July and August. Order 1. One Pistillum.

Some old writers have attributed to this genus the power of taming and reconciling ferocious and discordant animals, by putting it about their yokes or necks; in our improved state of knowledge, how this fanciful opinion could have prevailed is difficult to guess, and it is now of no further importance than to account for the etymology of its English name.

COMMON AGRIMONY blossoms in June and July, and is common every where in rough borders of fields, and other waste places. When this plant is begining to flower, it will dye wooll of a good bright Order 2. Two Pistilla.

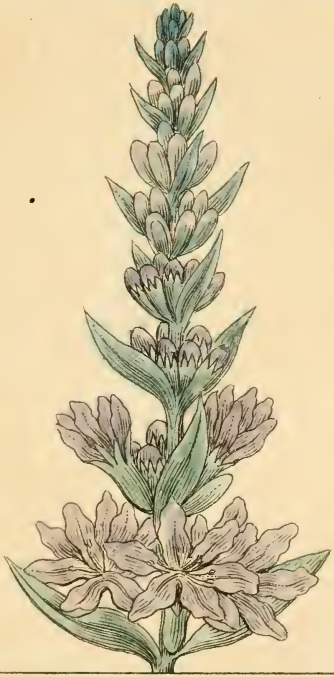
nankin colour; if gathered in September it yields a dark yellow. It gives a good colour in all states, and though a common plant, and easily cultivated, I believe it has not yet been applied to any of the purposes of dying.

The odorous Mignonette, and the common Houseleek, that at once ornaments and decays the roof of the thatched cottage, are of different orders in this class.

CLASS XI

ORDER 1

PURPLE LOOSESTRIFE

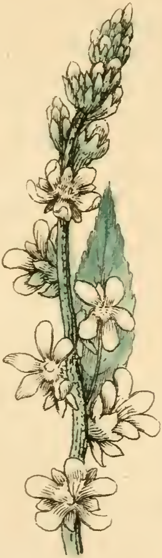


LYTHRUM SALICARIA

CLASS XI

ORDER 2

COMMON AGRIMONY



AGRIMONIA EUPATORIA

CLASS XII.

TWENTY STAMINA.

This Class has three Orders.

THIS class is said to have twenty Stamina, but the precision of the number is not of so much importance as their insertion into the Calyx, which, though an additional circumstance, is essential to the character of the Class.[a]

Order I. One Pistillum.

CHERRY LAUREL is a native of the Levant, and of Persia, and was first cultivated in Europe in 1576. In England it was a scarce plant in the reign of Charles I. and a merchant, who possessed one in his garden at Highgate, in the year 1629, defended it every winter from the severity of the cold by covering it with a blanket; but this plant is now not generally injured by the severity of our climate, and is so common every where, that the aid of reflection is necessary to suppose it ever to have been rare. It blossoms in April, and in the autumn produces a black berry somewhat like a cherry or small plum; hence it has been classed by Linnæus with the genus *Prunus*, under which head it is to be found in modern botanical works.

---

[a] It is a curious fact in nature, that whenever Stamina are inserted into the Calyx, whether the number be few or many, the fruit has been found to be invariably wholesome.

The fruit of this shrub, agreeably to the general law of nature, where the Stamina are found inserted into the Calyx, is not prejudicial if eaten; yet a distillation from its leaves produces the strongest vegetable poison we are acquainted with. Before the year 1728, this poisonous quality was not known; previous to that time the common people in Ireland were used to mix one part of laurel-water with four of brandy in their drams, and without being conscious of any particular ill effect from the practice; but in that year two persons were suddenly killed by taking about four table spoonsful each as a cordial, which gave the first proof of its being a powerful poison.

Order 2.
Five Pistilla.

SERVICE TREE is a native of the warmer parts of Europe, where it becomes a large and lofty tree. Ray says that it has been observed to grow in many places in the mountainous parts of Cornwall; and by Dr. Plot, to grow wild in many places of the Moorlands in Staffordshire. There is a solitary tree in the middle of the Forest of Wire, near Bewdley, which, to increase the wonder, has been considered to be wild, but there are evident marks of that tree having been planted there.

The tree blossoms in May, and the fruit in taste is somewhat like a medlar, but inferior.

I have called it *Pyrus Domestica,* in conformity to the opinion of Dr. Smith and Crantz, and in which

Professor Martyn concurs, though, in his Dictionary, he has continued the name of *Sorbus*.

Order 3. Pistilla numerous and indefinite.

APPLE ROSE, blossoms in June, and grows wild in the north of England, and in some parts of Scotland.

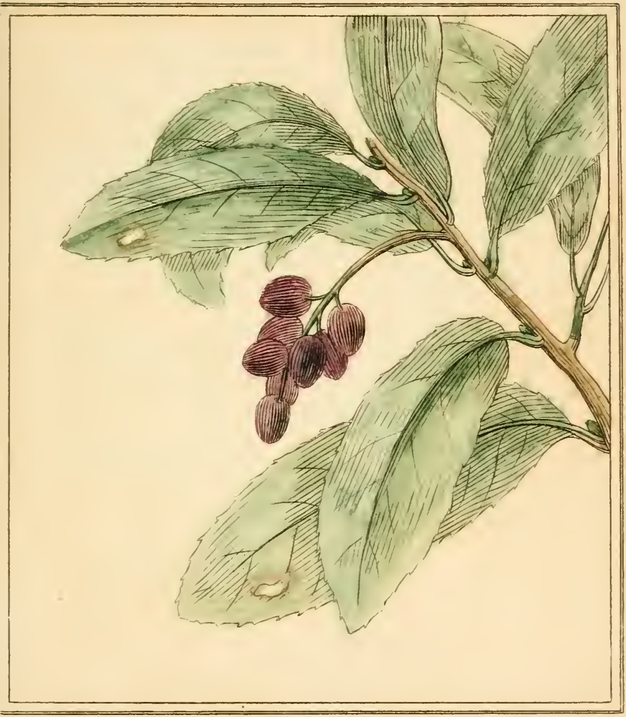
Flowers in an uncultivated and wild state, generally grow single; but it has been remarked, that every species of wild Rose is also found double in Scotland.

> Fair is the Rose, but withers soon away;
> Fair the spring Violets, but soon decay;
> Fair is the Lily, but in falling dies;
> And the white snow not long unsullied lies:
> Thus blooming youthful beauty quickly flies.

CLASS XII

ORDER 1

CHERRY LAUREL

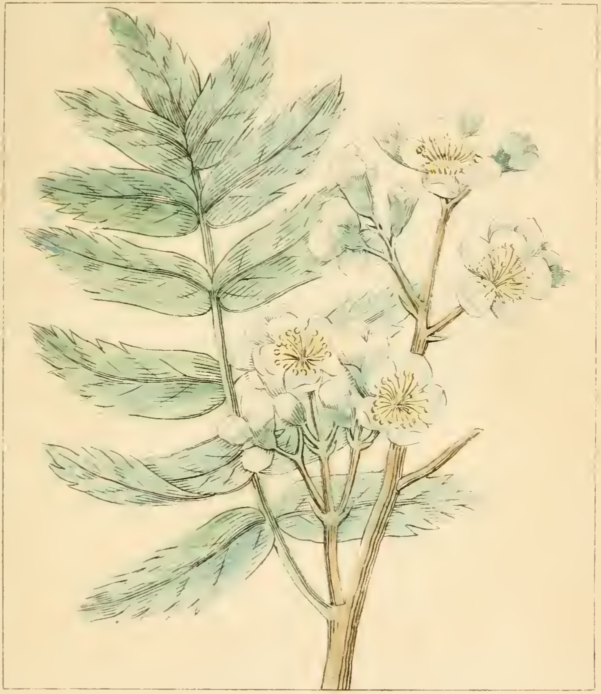


LAURO-CERASUS

CLASS XII

ORDER 2

SERVICE TREE

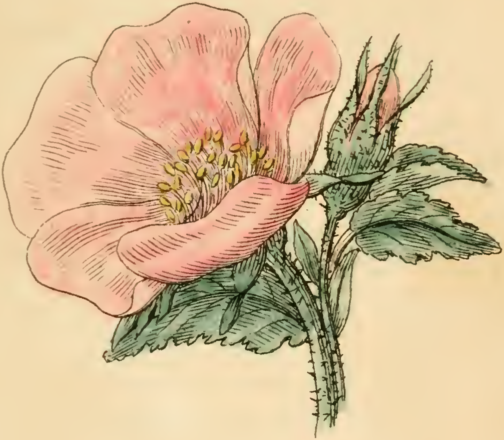


PYRUS DOMESTICA

CLASS XII

ORDER 3

APPLE ROSE



ROSA VILLOSA

CLASS XIII.

STAMINA NUMEROUS AND INDEFINITE.

This Class has seven Orders.

Besides the indefinite number of stamina, usually more than twenty, which is the character of this class, they must be inserted in the Receptaculum, as Class XII. required them to be inserted in the Calyx.

Order 1.
One Pistillum

WHITE WATER-LILY. This plant grows in rivers and large pools, in dark mud, and blossoms in the middle of summer very plentifully: the flower has much the air of a tropical production; but it has no scent, and fades very soon after it is gathered.

The laws of the vegetable world are perhaps as numerous and infinitely various as of the other kingdoms of nature, though less obvious to common observers. If plants do not possess sensibility they often possess irritability, and habits very analogous to those of animal life. Linnæus has enumerated forty-six different flowers that close and open at certain hours of the day. Some plants fold their leaves, or the petals of their flowers, as if to take rest, or prevent being stimulated by external bodies, some in the day only, and others only in the night, and this Linnæus calls the sleep of plants, from the apparent resemblance to that state among animals. The White

Water-Lily not only closes its flower in the evening, but sinks under the surface of the water, as if to take its rest in its natural element, and in the returning day lifts its head again erect to expand its inflorescence to the sun.

Order 2.
Two Pistilla.

ENTIRE-LEAVED PÆONY. This plant is named after Pæon, a famous physician of antiquity. It blossoms in May and June; it is a native of several parts of Europe, and Dr. Smith supposes it also to be a native of England. There are five species of this genus, and this, which is here represented in its wild state, is probably, when cultivated, the double-leaved Pæony of our gardens. There is a superstitious opinion prevails concerning the efficacy of the root of this plant to facilitate the growth of children's teeth: bits of it are dried and rubbed smooth, and strung, and sold by the name of Anodyne Necklaces, for that purpose.

Order 3.
Thre. Pistilla.

TEA TREE. This plant is a native of China and Japan, and in those countries only cultivated for use. In China it is cultivated in the open fields in every latitude between Canton and Pekin; but the best tea is said to grow in a mild and temperate climate in the country about Nankin. It delights in sloping banks of hills facing the south, especially in the neighbourhood of rivers and rivulets.

In Japan the tea which is most esteemed grows in the neighbourhood of a small town called Udsi, situated near the sea. Here is a celebrated mountain of the same name, the whole of which is occupied in the culture of the tea for the Emperor's use. This mountain is entirely surrounded with a wide ditch to keep out both men and beasts. The plantations are made in regular rows, and when the leaves are gathered, the men employed for that purpose wear gloves, and are obliged to bathe two or three times a day, lest the delicate flavour of the leaf should be injured in gathering.

In other parts of this country the tea is usually sown in the month of February, in the borders of fields which are cultivated with other produce; not in a continued hedge, but at moderate intervals, both that its shade may not be injurious to the general crop, and that the leaves may be the more easily collected. As the seeds are very subject to be damaged, from six to twelve are put into one hole, a fifth part not being expected to grow. When the tree is three years old the leaves may be plucked; when it is seven years old it no longer bears any quantity, and is then usually cut down to the root, when the stool sends forth many new shoots, which afford a plentiful supply. Sometimes this operation is deferred till the tenth year.

The tea is gathered at three separate times: the tenderest leaves, of but a few days growth, are gathered in February or the beginning of March; the second gathering is in the beginning of April; and the third about June, when the leaves are full grown. The tea is afterwards prepared by drying it in a stove in shallow iron pans; and the supposition of its ever being dried on copper, to give a more beautiful green to the leaves, is entirely void of foundation.

Of this plant it is generally believed that there is only one species; the difference of green and Bohea tea depending upon the nature of the soil, the culture, and the manner of drying the leaves. It has been observed that the green-tea tree, planted in the Bohea country, will produce Bohea-tea, and so on the contrary. The tree is an evergreen, and grows to about six feet in height, according to the best information we have upon the subject.

Tea was first introduced into Europe by the Dutch East India Company in 1641, and a small quantity was brought to England from Holland about the year 1666, by Lord Arlington and Lord Ossery, from whom it soon became known to the people of fashion, and its use ever since has become general. In China the use of tea is derived from very remote antiquity, and is so universal among all ranks of people in that vast empire, that, we are assured by Sir Geo. Staunton, if the Europeans were entirely to cease from trading in it, it would very little affect the price of tea in China, though, according to Dr. Lettsom's Tables, it appears that the quantity of tea imported into Europe from 1776 to 1794, amounted annually to 15, 20, 25, 29, and even to 36 millions of pounds.

John Ellis, Esq. well known for his excellent works on corals and corallines, previous to the year 1768, set several tea seeds, sent to him from China, in pots in the open air in London, from which he raised one plant; and this was probably the first tea plant ever raised in England. In the year 1771, a tea tree blossomed for the first time in England, at Sion House, in the months of October and November.

Much has been said about the unwholesomeness of this plant, and perhaps truly, with respect to some of its properties; but your Grandmamma has now drank strong green tea for more than seventy years; and my best wish for you is, that you may always have as bright an intellect, and as steady a hand at her age, as she has now.

It has been much the habit of studious men to indulge in drinking tea. I once called upon the great Professor Porson at five o'clock, when I myself was going to dinner, and found him in his room alone, sitting over his books, with a disorderly tea equipage on the table, and his tea-pot standing on a trevet before the fire. Dr. Johnson would sometimes drink more than twenty cups at a sitting; and he tells us himself, that he was 'a hardened and shameless tea-drinker; who, for twenty years, diluted his meals with only the infusion of this fascinating plant; whose kettle had scarcely time to cool; who with tea amused the evening, with tea solaced the midnight, and with tea welcomed the morning.' Nevertheless, according to the same enthusiastic admirer of it, its proper use is to amuse the idle, to relax the studious, and to dilute the full meals of those who cannot use exercise, and will not use abstinence.

Order 7. Pistilla numerous and indefinite.

LOTUS OF INDIA. This plant is a native of still pools and recesses in the margins of running streams in the East Indies, growing in a deep muddy soil, in a depth of water not less than two or three feet, nor more than six.

When the seeds become ripe, the capsule containing them separates from its footstalk, and falls into the water with all the seeds in their respective cells, which then begin to vegetate, and thus present a cornucopia of young sprouting plants, which, after a time, loosen from their confinement and take root in the mud.[a] This particular mode of propogation has occasioned this plant, in conjunction with water, to be adopted as the symbol of fertility, in which point of view it has, from the remotest antiquity, been considered with religious veneration in India, and makes a conspicuous figure in the mythology of that ancient country.

---

[a] In Mr. Sowerby's Exotic Botany there is a beautiful figure of this plant, with its general appearance in the water, and a ripe capsule with its seeds, accompanied by a learned dissertation by Dr. Smith.

In the fourth volume of Amænitates Academicæ, p. 234, a carved horn of a rhinoceros, sent to Linnæus from China, is described. Dr. Smith is now in possession of it, who, speaking of it, ſays that it is of exquisite oriental sculpture, evidently alluding to the mythology of India. The whole inverted base of the horn is carved into an elegant leaf of the Nelumbo rising from the water amid a group of perforated Chinese rocks. It is encompassed with various plants of a more diminutive proportion; a Peach tree and a Medlar (or rather perhaps a Mangostan), with *Sagitaria*, *Pothos*, and the *Nelumbo* itself, in flower and seed, cover the outer surface. Some fantastic lizards, with bunches of grapes and the Lit-chi fruit in their mouths, are crawling over the whole.

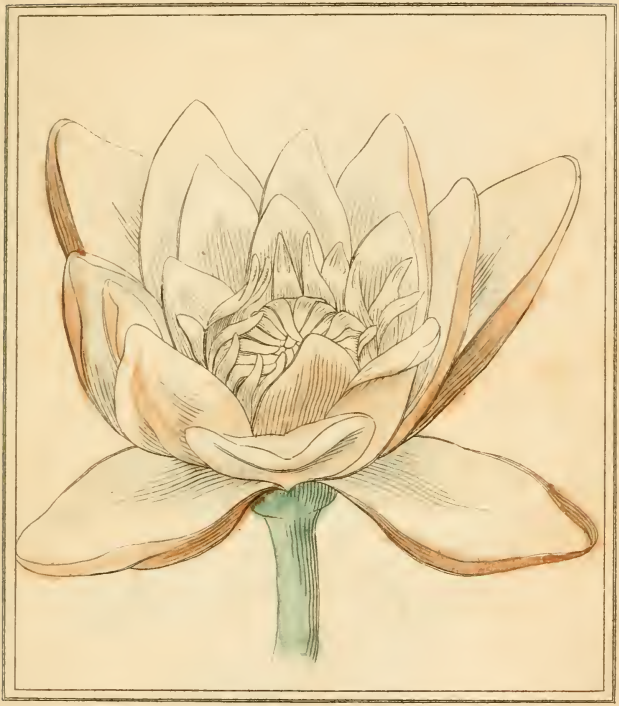
Of the beans the Egyptians make bread; but they were prohibited to be eaten by their priests, and also by the disciples of Pythagoras. In the works of Sir William Jones there are innumerable illustrations respecting this plant as connected with the poetry and the religion of the Hindoos: and I have no doubt this is the herb Lotus referred to in the works of Homer and Virgil. There was also a tree Lotus among the ancients, which produced a fruit in shape and size resembling an olive, and had a sweet taste like honey, from which a cordial spirit was extracted that was said to make men forget their cares.

THE END OF VOL. I.

CLASS XIII

ORDER 1

WHITE WATER-LILY

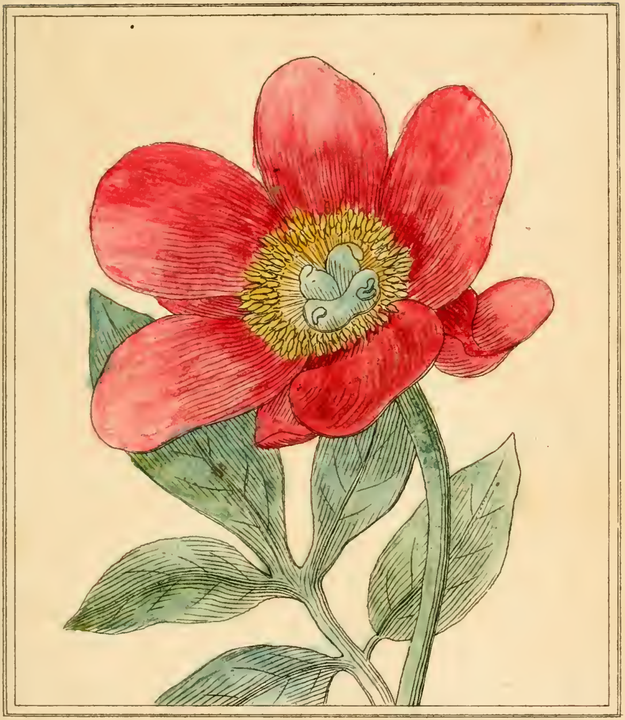


NYMPHÆA ALBA

CLASS XIII

ORDER 2

PÆONY

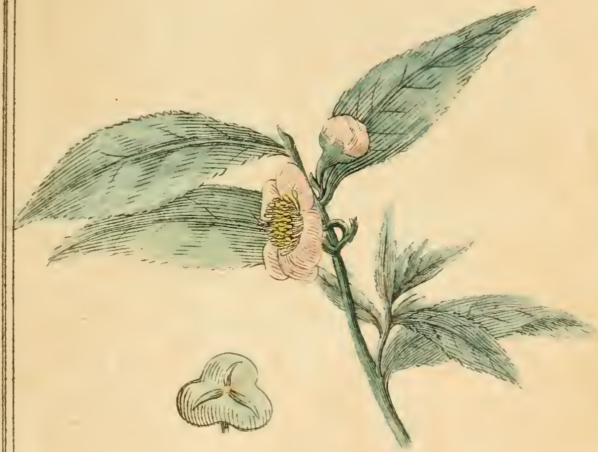


PÆONIA CORALLINA

CLASS XIII

ORDER 3

TEA TREE

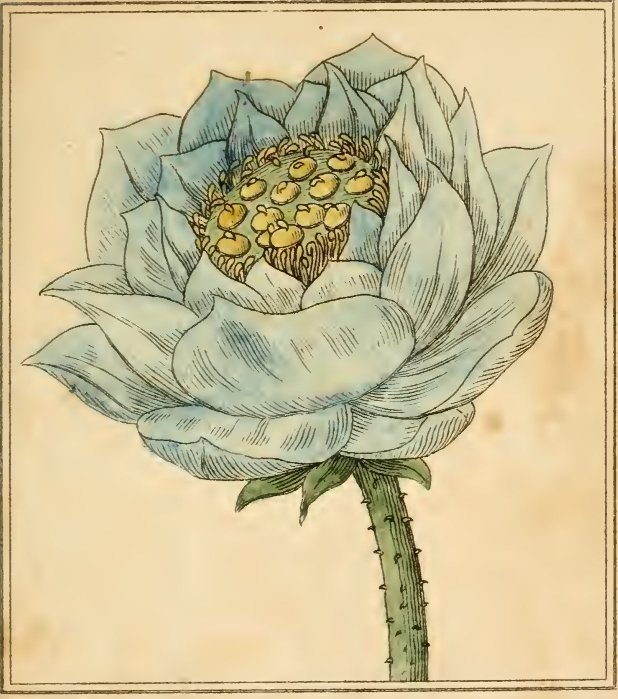


THEA

CLASS XIII

ORDER 4

LOTUS OF INDIA



CYAMUS NELUMBO

ELEMENTS

OF THE

SCIENCE OF BOTANY,

AS ESTABLISHED

BY LINNÆUS;

WITH

EXAMPLES TO ILLUSTRATE THE CLASSES AND
ORDERS OF HIS SYSTEM.

LIBRARY

'Knowledge is a defence, and giveth life to them that have it.'

VOL. II.

LONDON:
PRINTED BY T. BENSLEY, BOLT COURT,
FOR
J. MURRAY, FLEET STREET.

MDCCCIX.

LIBRARY
NEW YORK
BOTANICAL
GARDEN

CLASS XIV.

FOUR STAMINA, 2 LONG AND 2 SHORT.

This Class has two Orders.

THIS Class contains most of the labiate, ringent, or personate flowers, as the Balm, Dead-nettle, Snapdragon, Fox-glove, &c.

The Orders of this Class are named after the manner of producing their seeds. The first Order produces naked seeds at the bottom of a Calyx, usually four in number. The second Order produces seeds in a pod or capsule.[a]

Order 1.
Seeds exposed.

GROUND-IVY is common in dry groves, about hedge banks, under park walls or pales, and similar situations, where it puts out its fragrant foliage on the first approach of spring, and blossoms in April and May.

In Chili there is a plant of this Class and Order, called Saline Basil, which, although growing sixty miles from the sea, yet every morning it is covered with saline globules, which are hard and splendid, appearing at a distance like dew; each plant furnishes about an ounce of fine salt every day, which the peasants collect, and use as common salt, and esteem it superior in flavour.[b]

---

[a] The plants that produce naked seeds are generally aromatic, whilst those of the second order of this class producing their seeds in a pod, are of a poisonous nature.

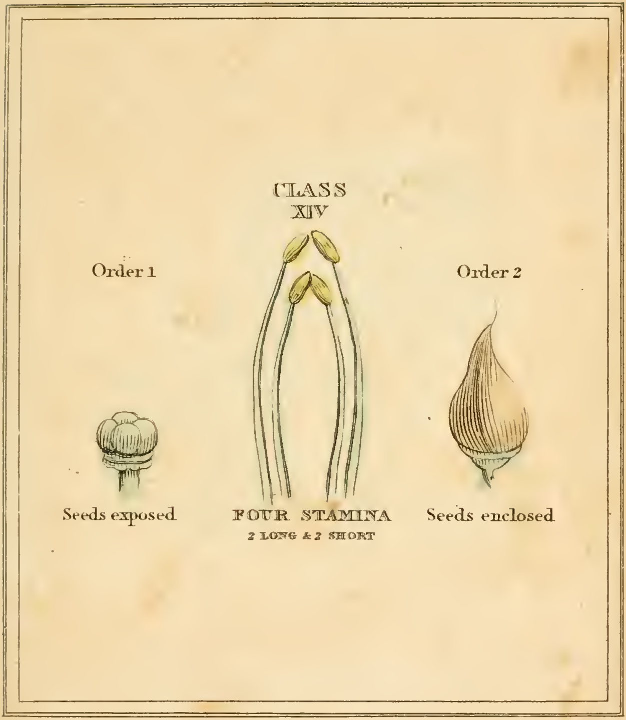
Order 2.
Seeds enclosed.

TWO-FLOWERED LINNÆA grows in dry, stony, mossy woods; it is found wild in the neighbourhood of Aberdeen, and blossoms in May and June. It is fragrant at night, and smells like the *Meadow-sweet.*

This flower was named after Linnæus, who discovered it in Lapland; he seems to have had a particular partiality to it; and traced a fanciful analogy between it and his own early fate—' a little northern ' plant, flowering early, depressed, abject, and long ' over-looked.'

---

[b] Salt is the only fossil substance, Dr. Darwin says, which the caprice of mankind has yet taken into their stomachs with their food; and, like all other unnatural stimuli, is not necessary to people in health, and contributes to weaken our system, though it may be useful as a medicine. It seems to be the immediate cause of the sea-scurvy, as those patients quickly recover by the use of fresh provisions; and is probably a remote cause of scrophula. I think the consideration of this subject of infinite importance in the rearing a young family.

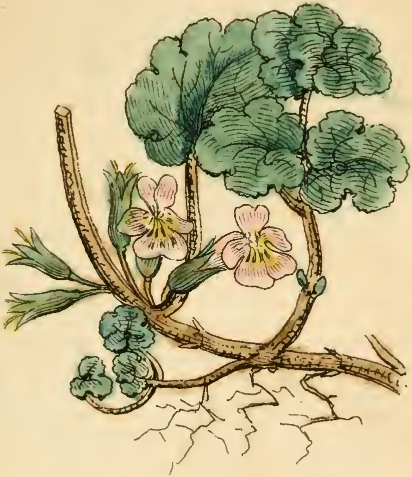


THE CHARACTER OF THE CLASS & ORDERS OF
CLASS XIV

CLASS XIV

ORDER 1

GROUND-IVY

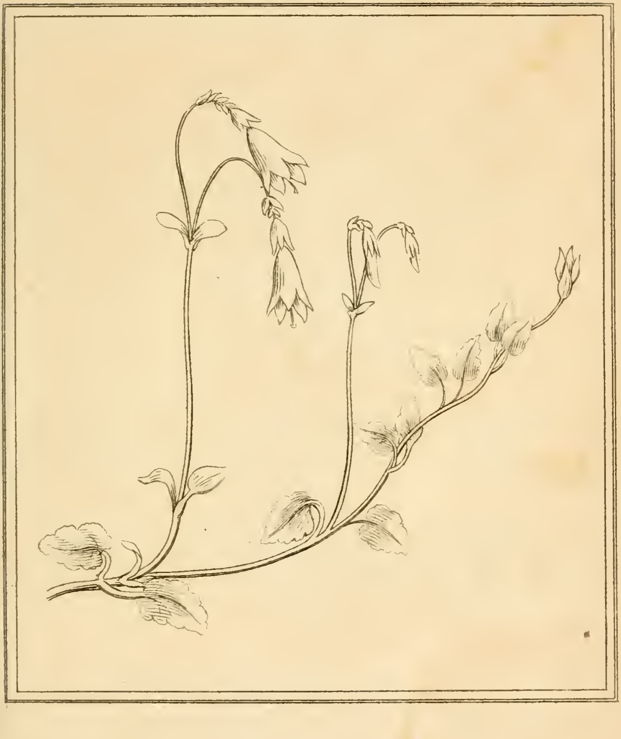


GLECHOMA HEDERACEA

CLASS XIV

ORDER 2

TWO-FLOWERED LINNÆA



LINNÆA BOREALIS

CLASS XV.

SIX STAMINA, 4 LONG AND 2 SHORT.

This Class has two Orders.

THE Orders of this Class, like the former, are named after the manner of producing their seeds. The first Order has its seeds in a short or roundish pod, or pouch. The second Order has its seeds contained in a very long pod.

All the plants of this Class possess similar virtues; they are termed acrid and antiscorbutic in their raw state, as Mustard and Water-cress; when cultivated and boiled, they become a mild wholesome food, as Cabbage, Turnip, &c.

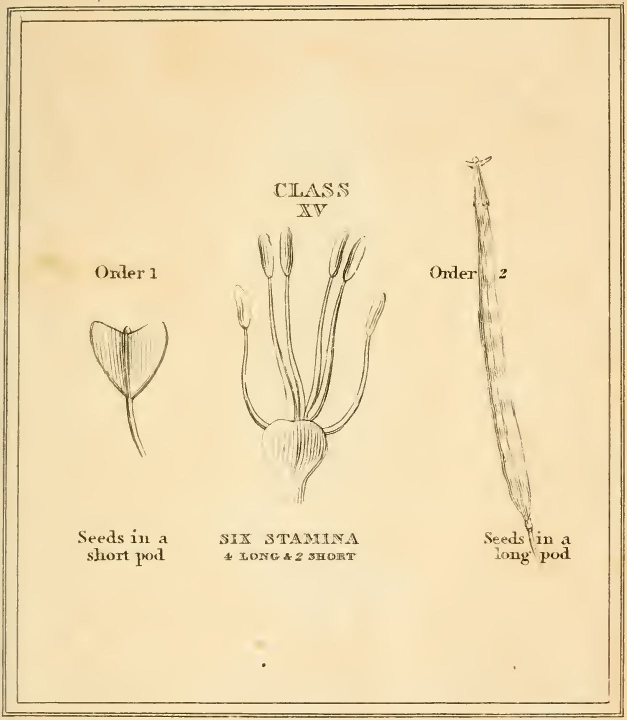
The flowers of this tribe of plants are called *cruciformed,* from their having four petals, which make a fanciful resemblance to a Greek cross.

Order 1. Seeds in a short Pod.

BITTER CANDY-TUFT is an annual plant, and grows wild in great plenty in Buckinghamshire. It blossoms in July, and the whole herb is nauseously bitter.

Order 2. Seeds in a long Pod.

CORAL-WORT is a rare plant, blossoms early in May, and is found wild in few parts of England; it grows in Buckinghamshire in shady places. In the bosom of most of the leaves stands a solitary bud, or bulb, which falling off, vegetates in the ground, and by this mean the plant is plentifully propagated. Its seeds are rarely ever perfected, as is common with plants that increase much by the root.

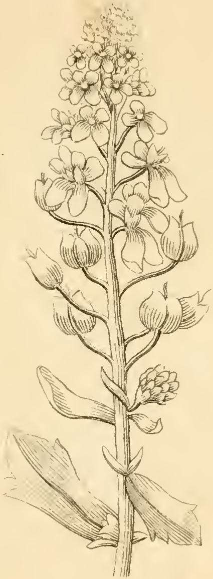


THE CHARACTER OF THE CLASS & ORDERS OF
CLASS XV

CLASS XV

ORDER 1

BITTER CANDY-TUFT

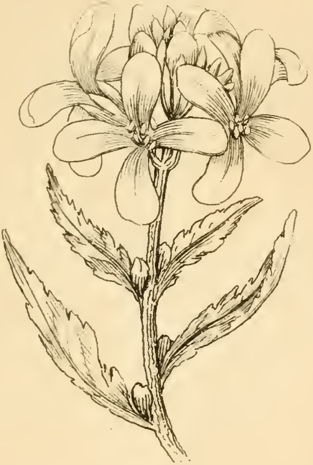


IBERIS AMARA

CLASS XV

ORDER 2

BULBIFEROUS CORAL-WORT



DENTARIA BULBIFERA

CLASS XVI.

ALL THE FILAMENTS OF THE STAMINA UNITED INTO ONE TUBE.

This Class has eight Orders.

Order 1. Three Stamina.

IRIS-LEAVED SISYRINCHIUM. This plant is a native of Bermuda, and grows from one to two feet and a half in height; it was known to the ancient Greeks, and its botanical name has its origin in two Greek words, that would seem to imply a fanciful resemblance in the flower to a swine's snout. There is no English plant of this Order.

Order 2. Five Stamina.

MARSH-MALLOW-LEAVED HERMANNIA is a native of the Cape. It is a plant of free growth, and produces flowers during most of the summer months. It bears its flowers in pairs, and the corollas are twisted, and as I have before remarked, always in contrary directions to each other. Muskey Stork's-bill, an English Geranium, is of this Order.

Order 3. Seven Stamina.

SORREL CRANE'S-BILL: its flowers continue in succession for most part of the summer.

Order 4. Eight Stamina.

CAPE AITONIA. Of this Genus there is only one known species; it has its name from Mr. Aiton the author of the Hortus Kewensis. It is a native of the Cape of Good Hope, and was brought to England in the year 1774. It is a green-house shrub, of slow growth, and seldom exceeds three feet in height, and when of a sufficient age, produces flowers and berries through most of the year.

Order 5. Ten Stamina.

MOUNTAIN CRANE'S-BILL. From the botanical name of this plant, it would seem to imply, that it was peculiarly a native of the Pyrenees, whereas it is found in waste ground, and the borders of fields, in various parts of Europe. It blossoms in July.

Under this Order Linnæus put the numerous Genus of Geraniums, but since his time they have been divided into three Genera, which are now arranged under this and the two penultima Orders. This tribe of plants consists of more than eighty species, and it is remarkable that the fertilizing pollen of these flowers is very apt to mix with others of different species, and so produce new species or varieties; but these plants rapidly degenerate, and in a few years become extinct, although reproduced by seed.

Order 6. Nineteen Stamina.

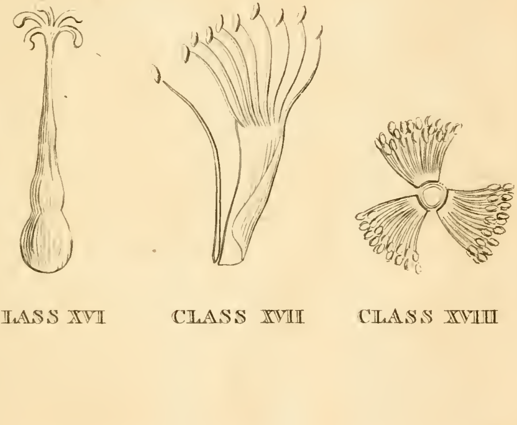
BROWNEA. This is the only Genus in this Order. It is a shrub, or small tree, growing to the height of eighteen feet in woody and hilly places in America: the wood is covered with an ash-coloured bark. The blossom is scarlet. It has its name from Dr. Brown, author of the History of Jamaica. The practice of distinguishing different genera of plants by personal names, may have had its influence, however trifling, as an incentive to the pursuit of Botany; and though no exception can justly be made to it as a reward for the ability or patronage of distinguished persons, yet such names as *Rudbeckia, Rotbollia,* and *Holmskioldia,* are very uncouth; but an *Amelia elegantissima,* I hope will one day or other palliate these harsh sounds.

Order 8. Stamina numerous and indefinite.

COMMON COTTON. This is an herbaceous plant, a native of the East Indies, growing to about three feet high. The whole plant is downy, and whilst young, odorous. The blossom is of a pale yellow, with five red spots at the bottom, and its seeds, which are ripened in September, are immersed in fine white cotton: that cotton, which is produced in China, of which the cloth called Nankin, is made, is said to be tinged with red in its vegetable state, which is supposed to be the cause of its washing better than any cloth that we can manufacture to imitate it. Few plants are more useful than this: it furnishes clothing to the four quarters of the world; and the seeds are an article of food to the inhabitants where it is cultivated.

There are six species of this Genus, and the Barbadoes cotton is the species the most cultivated in the West Indies, and forms a considerable branch of their exports.

This cotton plant is set in rows in the West Indies, about five feet apart. It grows from four to six feet high, and produces two crops annually; the first in eight months from the time of sowing the seed, and the second four months afterwards. Each plant at the two gatherings is reckoned to produce about one pound weight of cotton; and an acre of land to produce 270 pounds weight on an average.



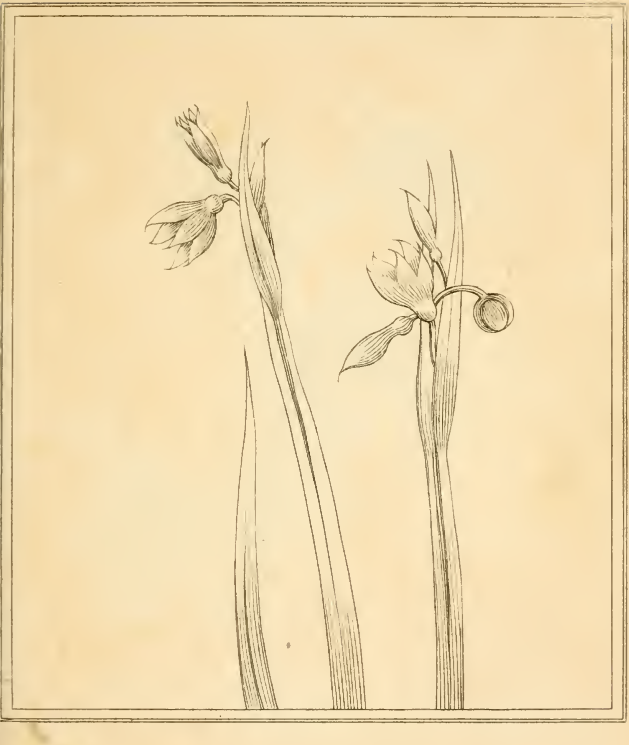
CLASS XVI CLASS XVII CLASS XVIII

THE CHARACTER OF CLASS XVI. XVII. XVIII.

CLASS XVI

ORDER 1

IRIS-LEAVED SISYRINCHIUM

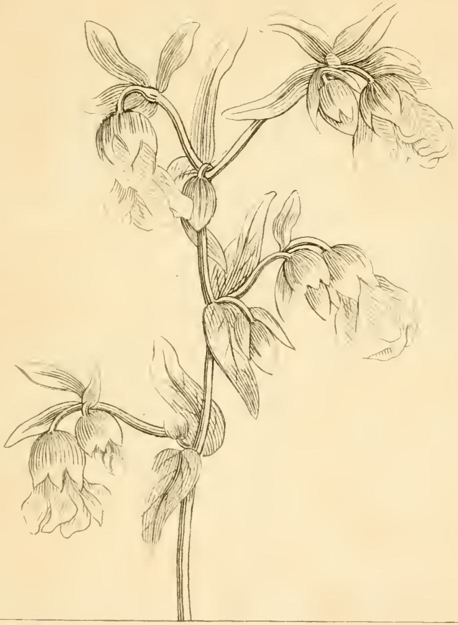


SYSYRINCHIUM BERMUDIANA

CLASS XVI

ORDER 2

HERMANNIA

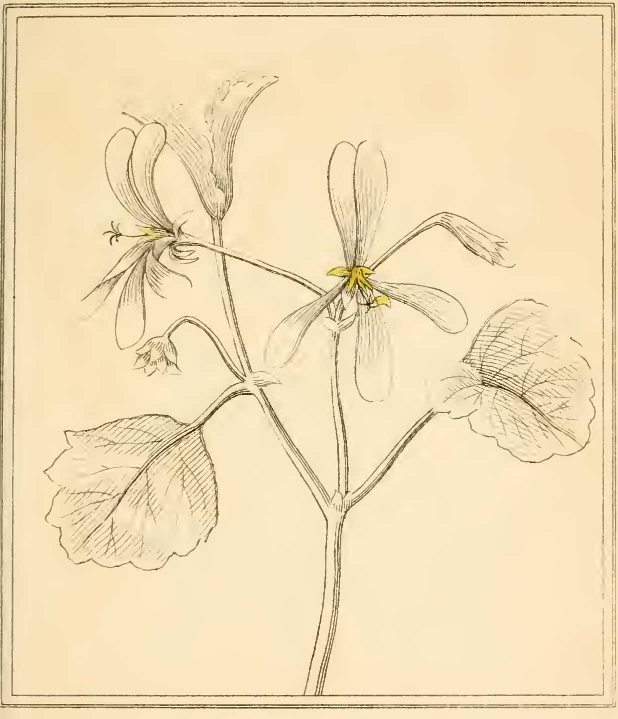


HERMANNIA ALTHÆIFOLIA

CLASS XVI

ORDER 3

SORREL CRANES-BILL

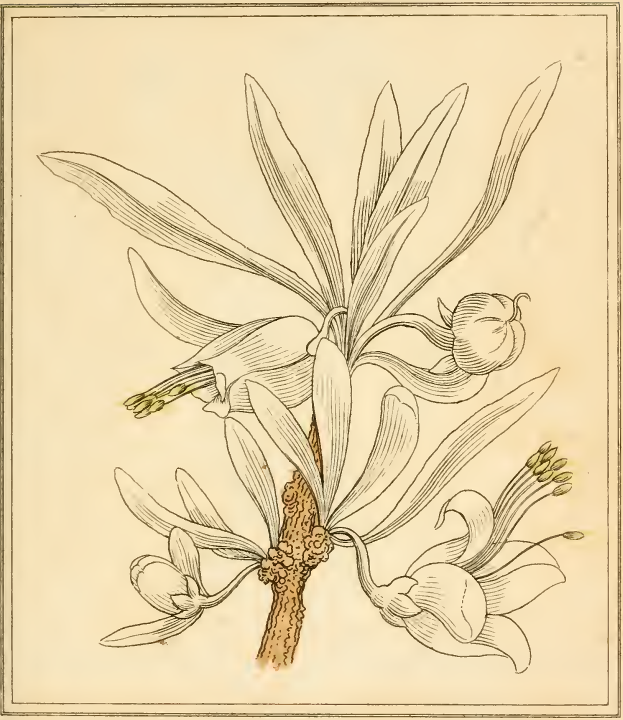


PELAGONIUM ACETOSUM

CLASS XVI

ORDER 4

CAPE AITONIA

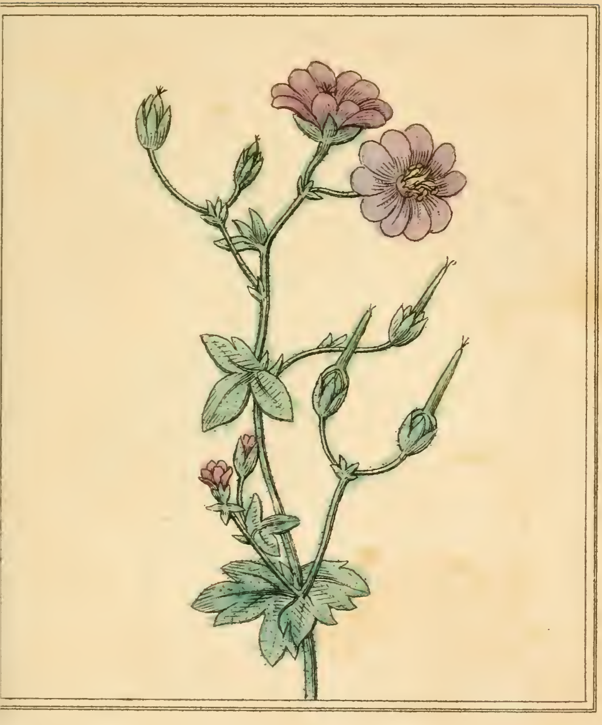


AITONIA CAPENSIS

CLASS XVI

ORDER 5

MOUNTAIN CRANES-BILL

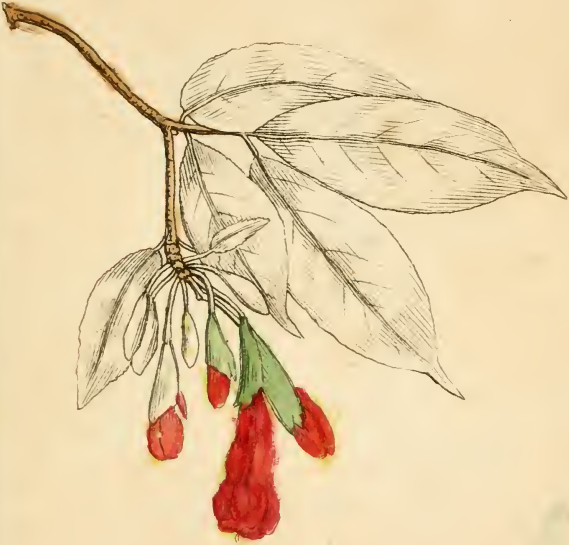


GERANIUM PYRENAICUM

CLASS XVI

ORDER 6

BROWNEA

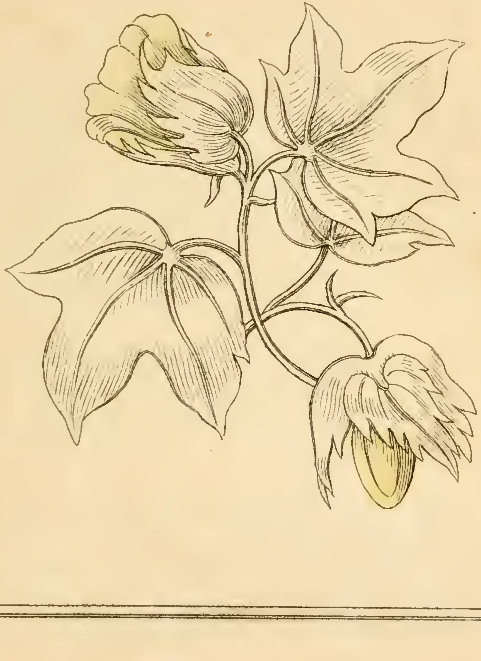


BROWNEA RACEMOSA

CLASS XVI

ORDER 8

COMMON COTTON



GOSSIPIUM HERBACIUM

CLASS XVII.

THE FILAMENTS OF THE STAMINA UNITED, MAKING TWO SETS.

This Class has four Orders.

Order 1.
Five Stamina.

THREE-LEAVED MONNIERIA,[a] is the only Genus in this Order, a very scarce annual plant, with white flowers, a native of South America, and of which there is no good figure that can be accurately depended upon: the one annexed is copied from the French Encyclopid Methodique, which is the best representation there is of it, and that was delineated from a dryed specimen.

Order 2.
Six Stamina.

YELLOW FUMITORY. This plant is a native of Barbary, and blossoms in May. Its leaves continue green all the year, and the flowers in succession till October.

Order 3.
Eight Stamina.

MYRTLE-LEAVED POLYGALA is a native of the Cape of Good Hope, and is the principal Genus in this Order. It is a shrubby plant, covered with a smooth brown bark, growing to the height of five or six feet. The flowers continue in succession for most part of the summer, and are white on the outside, but purple within.

---

[a] This plant is named after M. Monnier, of Paris.

Order 4. Ten Stamina.

SENSITIVE HEDYSARUM, is a native of Bengal, near the Ganges, and was first introduced into England by Dr. Russel, in 1775. This may be considered as one of the most extraordinary plants in the vegetable world. When the air is very warm, and quite still, its leaves are in continual motion, some rising, others falling, and others whorling circularly, by twisting their stems: the cause of these phenomena is not at all accounted for. Dr. Darwin conjectures that this spontaneous motion may be necessary to the plant, as perpetual respiration is to animal life.

It grows about three feet high; the leaves are of a bright green, with somewhat of a sea-green hue in the middle; the flowers are of a pale red, slightly tinged with blue, and sometimes with yellow.

To this Order belongs the leguminous vegetables, as the Pea, Bean, Vetch, &c.[b] they are all said to be wholesome, but I believe there are some exceptions to the rule. The seeds of the Citisis Labernum, in their green state, have an emetic quality; and those beautiful red seeds with a black spot, brought from India, which are sometimes worn as ornaments of dress,[c] are said by the natives to be so dangerous, that the half of one of them is sufficiently poisonous to destroy a man; this account, however, seems to exceed probability, but that they have a very prejudicial quality I have no doubt; for, within my own knowledge, I have seen an extraordinary effect of the poison of one of these peas. A poor woman who had some of them given to her, and who did not choose to be at the expense of having them drilled, to put on a thread so as to make a necklace of them, put the seeds into hot water till they were sufficiently soft to be perforated with a large needle, in performing this operation, she accidentally wounded her finger, which, in a short time, became very painful, swelled considerably, the swelling soon extended to the whole hand; and it was a considerable time before she recovered the use of it.

---

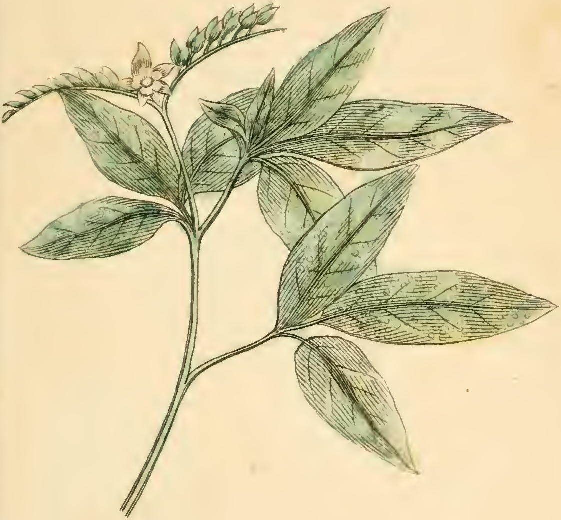
[b] That which in common language is called a *pea-shell.* in the language of Botany is called a *legumen*, the seeds being arranged along one of its sutures. When, in a similar covering, the seeds are affixed to the seams on both sides, as in the plants of the second Order of Class XV, that kind of seed-vessel is properly called a *pod*, In the English language this discrimination is not attended to.

[c] The Botanical name of the plant that produces this Pea is *Abrus Precatorius.*

CLASS XVII

ORDER 1

THREE-LEAVED MONNIERIA

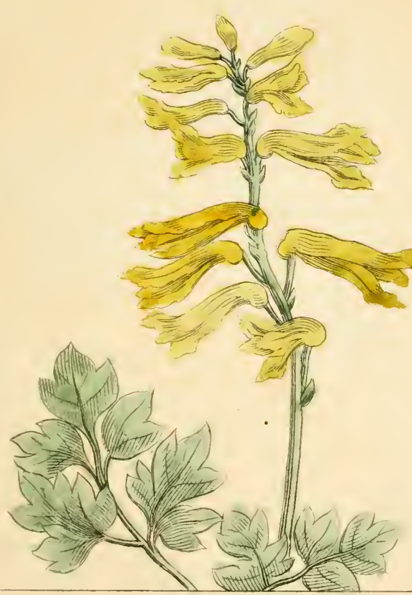


MONNIERIA TRIFOLIA

CLASS XVII

ORDER 2

YELLOW FUMITORY

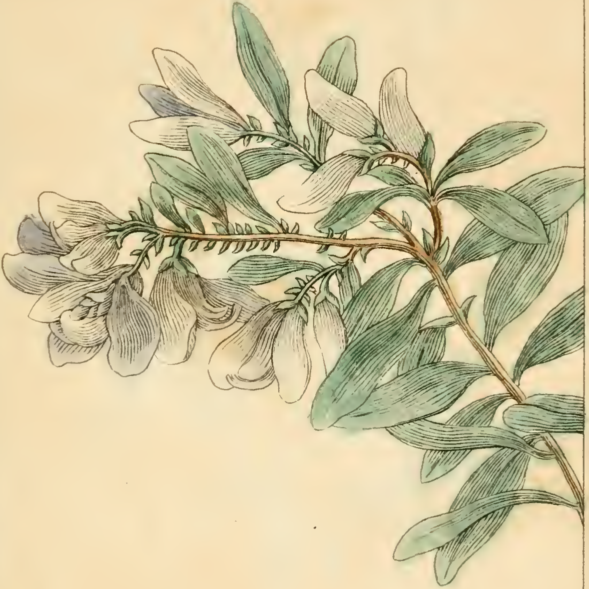


FUMARIA LUTEA

CLASS XVII

ORDER 3

MYRTLE-LEAVED POLYGALA

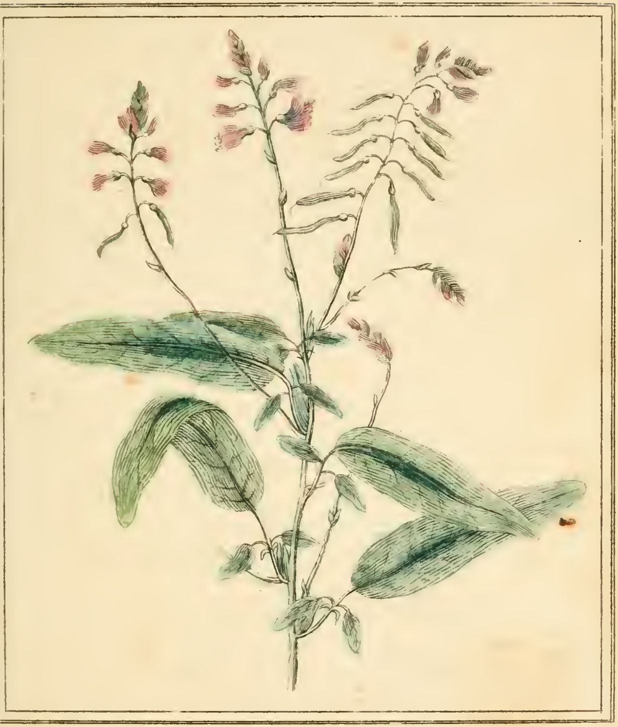


POLYGALA MYRTIFOLIA

CLASS XVII

ORDER 4

SENSITIVE HEDYSARUM



HEDYSARUM GYRANS

CLASS XVIII.

THE FILAMENTS OF THE STAMINA UNITED, MAKING MORE THAN TWO PARCELS.

This Class has three Orders.

Order 1. Stamina from twelve to twenty, or twenty-five, their filaments being unconnected with the Calyx.

ORANGE TREE, a native of India, but grows luxuriantly in many parts of Europe. This fruit was not known to the ancient Greeks or Romans; but the oranges which are now produced in Malta are those that are most esteemed. The Pomegranate is supposed to be the Golden-apple of the ancients. There is one kind of Orange, the pulp of which is tinged with red, said to be produced by grafting the common Orange on the Pomegranate; but this is a vulgar and unfounded opinion, as the dark-coloured, called a black rose, is said to be in consequence of grafting a red rose on a black currant tree, which is a common error of the same kind.

Order 2, of this Class, has numerous filaments inserted, in several parcels, into the calyx.

Order 3. Stamina very numerous, unconnected with the Calyx.

MARSH ST. JOHN'S-WORT. Of this Genus there are no less than fifty-seven species. This plant is produced in spongy bogs in several parts of England. It blossoms in July and August, but the flowers seldom expand unless in bright sunshine.

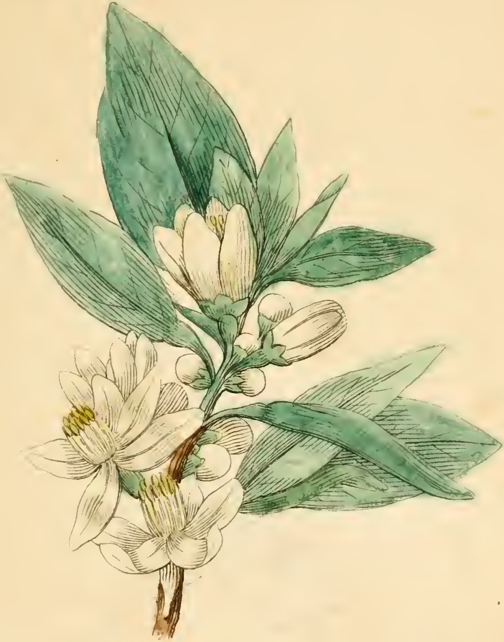
---

[d] The Botanical names of these Orders are, 1. Dodecandria. 2. Icosandria. 3. Polyandria.

CLASS XVIII

ORDER 1

ORANGE

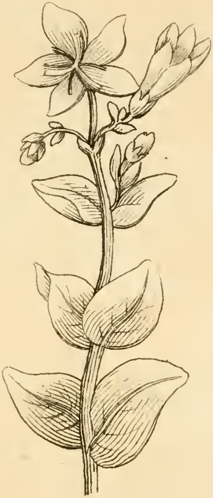


CITRUS AURANTIUM

CLASS XVIII

ORDER 3

MARSH S^T JOHN'S-WORT



HYPERICUM ELODES

CLASS XIX.

ANTHERÆ UNITED INTO A TUBE. FLOWERS COMPOUND.

This Class has five Orders.

This Class comprehends those flowers which are called *compound*. The essential character of a *compound flower* consists of the parts called the antheræ, already explained in the previous Classes, being united together so as to form a cylinder, and the filaments separate at the base:[e] which are, for the most part, five in number, and inserted into the *Corolla*. The Dandelion and Thistle are of this kind, composed of a number of small flowers called *Florets*. To illustrate the character of this Class, a Floret of the Dandelion is given, magnified: which plant is also of the first Order.

Order 1. Both parts of fructification complete in each Floret; and each Floret, without the assistance of any other, capable of producing perfect seed.

COMMON CARLINE is scattered over dry and sandy heaths and pastures, and blossoms in June and July.

The seeds of this flower, as of many others of this natural Class, are furnished with a plume, serving them as wings, which, in different plants, are differently constructed; some, like a divergent tuft of hair, others are branched like feathers; some are elevated from the crown of the seed by a slender foot-stalk, which gives them a very elegant appearance; others sit immediately on the crown of the seed itself: by this admirable contrivance they perform long aërial journeys, and are thus disseminated far from the parent plant.

---

[e] Those flowers which are composed of Florets where the *antheræ* are not united into a cylinder, are called aggregate flowers, as the Scabious, Class IV, and the Teasel, &c.

Order 2. The central Florets having both parts of fructification complete, while those in the circumference have Pistilla only, but both kinds producing perfect seed.

DAISY. With this interesting little flower every pasture and grass-plat is spangled, from the beginning of spring till the end of autumn.

It is called in French *La belle Margarete,* and with us the Daisy, being emblematical of the eye of the Day, from its opening to the rising sun. When the sun is declining the flower shuts itself up as if to take its rest. It has always been a favourite with Poets, and observers of Nature. Chaucer, who is among the first that takes notice of the opening and shutting of flowers, at particular times of the day, thus expressed his partiality for it.

Well by reason men is calle maie
The Daisie, or else the eye of the Daie
—— She that is of all flowris the floure,
Fulfilled of all virtue and honoure;
And even alike fair and fresh of hewe,
As well in winter as in summer newe,
As soon as ever the sunne-ginneth West
To sene this floure, how it will go to rest,
For fear of night, so hateth she darknesse;
Her chere is plainly spread in the brightnesse
Of the Sunne.——

Order 3. The central Florets having both parts of fructification complete, while those in the circumference have neither Stamina nor Pistilla.

BLUE BOTTLE. Of this Genus there are no less than seventy-seven species, and its botanical name is said to be derived from the Centaur Chiron, the preceptor of Achilles.

It is a common plant in corn-fields, and is a good example of this Order. It blossoms in June and the two succeeding months, and the petals are of a beautiful blue, though sometimes white and purple. The juice of the central florets, with the addition of a very small quantity of alum, is said by Boyle to make a lasting transparent blue, not much inferior to ultramarine; but as at this time the plant is not at all cultivated for the purposes of painting or dying, I fear subsequent experiments have proved unfavourable to its use as a permanent colour.

Order 4. The central Florets having Stamina only, and the Florets of the circumference only Pistilla.

GARDEN MARIGOLD grows wild in the southern countries of Europe, as the south of France and Italy. Of this species there are several varieties. According to Linnæus's observations these flowers are open from nine in the morning till three in the afternoon. The regular expansion of flowers attracted early notice; and in the poems of Rowley there is an allusion to this property in the Marigold.

> "The Mary-bud that shutteth with the light."

And in Shakespeare it is thus expressed:

> "The Marygold, that goes to bed wi' the sun,
> And with him rises weeping."

This property is not uncommon with plants in this natural Class. The Dandelion opens at five or six in the morning, and closes at nine. The Mouse-ear Hawk-weed opens at eight, and closes at twelve. The Sow-thistle opens at five, and closes between eleven and twelve, and the Goat's-beard opens at three in the morning, and closes at five or six in the morning, in fine weather.

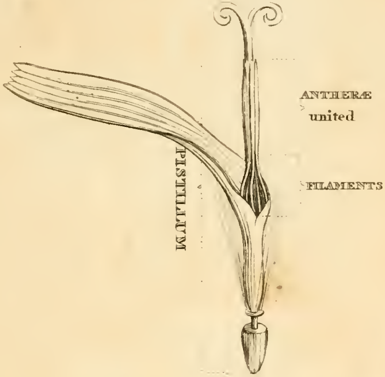
Order 5. * Compound Florets, each having a partial Calyx, but all included in one general Calyx.

GREAT GLOBE THISTLE blossoms in July, and the seeds ripen in August. It is a native of most of the countries in Europe, but not of England, and was introduced into our gardens in 1596. In its native state it grows in any soil or situation, but is not more than two feet high; by culture it grows to more than twice that height.

Of these two last Orders there is no native English plant.

---

* The Botanical names of these five Orders are, 1. Polygamia æqualis. 2. Polygamia superflua. 3. Polygamia frustranea. 4. Polygamia necessaria. 5. Polygamia segregata.



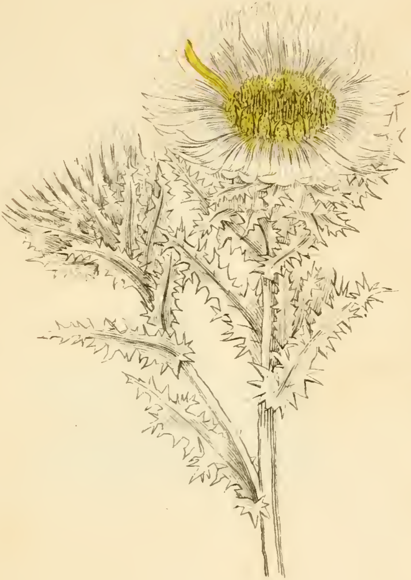
A FLORET OF THE DANDELION
magnified

THE CHARACTER OF CLASS XIX

CLASS XIX

ORDER 1

COMMON CARLINE

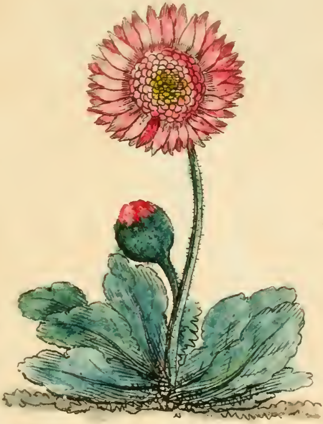


CARLINA VULGARIS

CLASS XIX

ORDER 2

COMMON DAISY

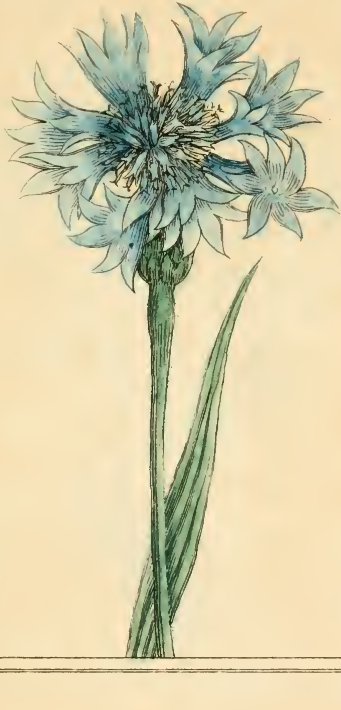


BELLIS PERENNIS

CLASS XIX

ORDER 3

BLUE-BOTTLE

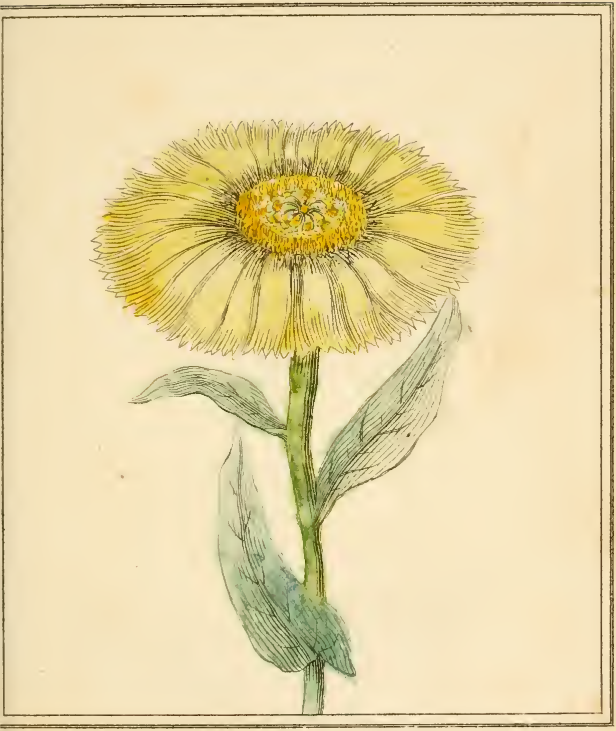


CENTAUREA CYANUS

CLASS XIX

ORDER 4

MARIGOLD

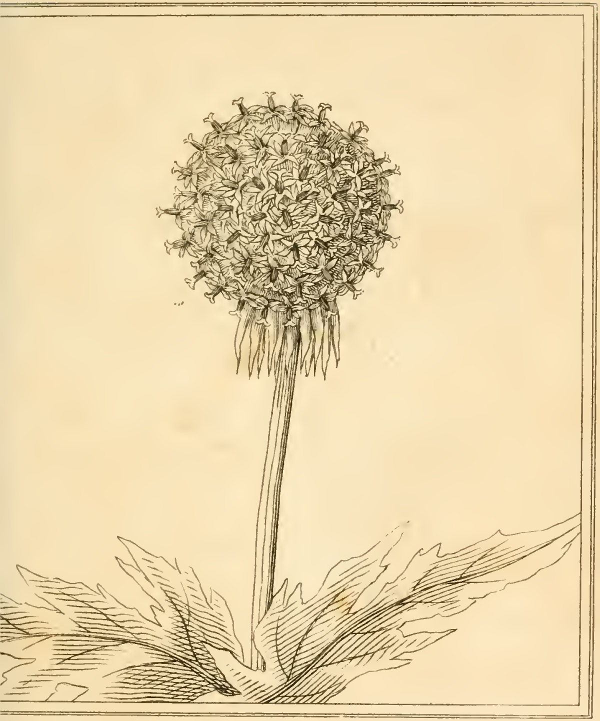


CALENDULA OFFICINALIS

CLASS XIX

ORDER 5

GREAT GLOBE THISTLE



ECHINOPS SPHÆROCEPHALUS

CLASS XX.

STAMINA SITUATED ON THE PISTILLUM.

This Class has nine Orders in the system of Linnæus, but some alterations concerning them are necessary, according to Dr. Smith.

Order 1.
One Stamen.

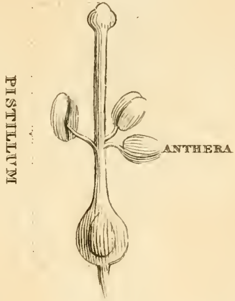
FLY ORCHIS: this curious flower is found in chalky soils, but is not very common. It is most plentiful in Kent and Cambridgeshire, and blossoms in May and June. There are other plants of this genus that equally resemble a Bee and a Spider. From the root of one species of this plant, when dried and reduced to powder, salop is made.

Order 2.
Two Stamina.

LADIES SLIPPER. This is among the scarcest of British plants, and from its beauty and singularity, has always been sold at the highest price of any British flower.

In its wild state it is confined to some remote and little frequented woods in the north of England, and may be considered as the queen of the European Orchideæ.

For the other Orders of this Class Dr. Smith's Introduction may be referred to.

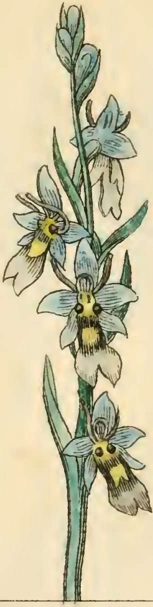


THE CHARACTER OF CLASS XX

CLASS XX

ORDER 1

FLY ORCHIS

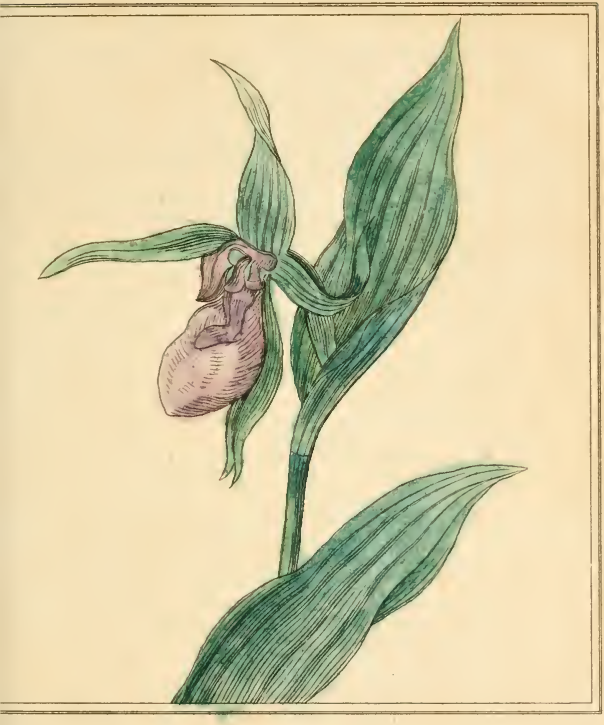


OPHRYS MUSCIFERA

CLASS XX

ORDER 2

LADIES SLIPPER



CYPRIPEDIUM

CLASS XXI.

STAMINA AND PISTILLA IN SEPARATE FLOWERS, BUT BOTH GROWING ON THE SAME INDIVIDUAL PLANT.

This Class has ten Orders.

Order 1. One Stamen.

BREAD-FRUIT TREE. This tree has been brought into particular notice since the discovery of Otaheite and the Sandwich Islands, where the fruit is eaten as bread. It is also a native of many islands in the East Indies, as Java, Amboyna, Banda, &c. but in those islands the tree was not cultivated, and little use was made of the produce.

The tree is described to be of the size of a middling Oak, and the fruit to be of the size and shape of a child's head, growing on boughs like apples, with a hard, thick, and tough rind. When it is ripe it is yellow and soft, and the taste sweet and pleasant. It is gathered when full grown, while it is green and hard, and baked in an oven, which scorches the rind and makes it black; the outside black crust is then scraped off, and there remains a tender thin crust; the middle, soft, tender, and as white as snow, and somewhat of the consistence of new bread. In this sort, which is the best, there is neither stone nor seed in the inside, but all of one pure uniform substance. It requires to be eaten new, for if it be kept more than twenty-four hours it becomes dry and choaky, but very pleasant before it is too stale, having somewhat of the taste of a Jerusalem Artichoke. This fruit lasts in season eight months in the year, during which time the natives of the islands in the South Seas, where the tree is cultivated, eat no other sort of food of the bread kind. Three trees are supposed to yield sufficient nourishment for one person.

There are several varieties of this tree, and the fruit of some has a core, and some, long oblong seeds, almost as large as chesnuts.

This tree is useful not only for food, but also for cloathing, for the inner rind of the young bark is manufactured into a kind of cloth.

In the year 1793 Captain Bligh took three hundred and forty-seven of these trees to Jamaica, and about the same number to St. Vincent's, in the West Indies, where they now continue to flourish and bear fruit, as in their native soil and climate.

Order 3. Three Stamina.

SEDGE. Of this plant there are enumerated no less than ninety-seven species. It is found on the banks of rivers, and will also grow in the middle of a ditch, or pond, and if suffered to increase, quickly fill up any piece of water. It has creeping roots, which easily make their way through any moorish ground, and hence the *Carex* is often found in meadows, though in such situations, of less luxuriant growth. From the joints of its horizontal roots it sends up stems, some producing flowers with stamina only, and others bearing flowers with only pistilla. In the annexed plate these two different flowers have the appearance of being on different plants, from the want of the connecting root, which has been omitted to increase the size of the representation. In a mild season it blossoms in April, and ripens its seeds in June and July.

In Herefordshire, and other Hop counties, the sedge is often used for tying up young Hop wires to the poles, and it is also employed to make common chair bottoms.

Of its use and importance in Lapland, Linnæus has given a very interesting account, of which this is Mr. Curtis's translation.

" Thou wilt wonder, perhaps, curious reader, in what manner human beings are capable of preserving life during an immense severity of a winter's frost in Lapland, a part of the world deserted on the approach of winter by almost every kind of bird and beast.

" The inhabitants of this inhospitable climate are obliged to wander with their rein-deer flocks continually in the woods, not only in the day-time, but through the longest winter nights; their cattle are never housed, nor do they eat any other food than liver-wort;[f] hence the herdsmen, to secure them from wild beasts, and other accidents, are of necessity kept perpetually with them. The darkness of their nights is, in a degree, overcome and rendered more tolerable by the light of the stars reflected from the snow, and the Aurora Borealis, which in a thousand fantastic forms nightly illumines their hemisphere. The cold is intense, sufficient to frighten and drive us foreigners from their happy woods. No part of our bodies is so liable to be destroyed by cold, as the extremities, which are situated farthest from the heart; the chilblains of the hands and feet, so frequent with us in Sweden, sufficiently indicate this. In no part of Lapland do we find the inhabitants affected with chilblains, though in respect to the country one would expect them to be peculiarly subject to this disease, especially as they wear no stockings, while we clothe ourselves in one, two, and even three pair.

---

[f] This liver-wort is the Rein-Deer Lichen, Class XXIV.

" A Laplander preserves himself from the violence of cold in the following manner; he wears trowsers, made of the rough skin of the rein-deer, which reach to his ankles, and shoes made of the same material, the hair turned outward; this grass, cut down in the summer, dried, rubbed betwixt the hands, and afterwards combed and carded, he puts into his shoes, so as not only wholly to enwrap his feet, but the lower part of his legs also, which, thus defended, never suffer from the severest cold; with this grass he also fills his hairy gloves to preserve his hands; and thus are those hardy people enabled to bear the frost.

" As this grass in the winter drives away cold, so in the summer it checks the perspiration of the feet, and preserves them from being injured by stones in travelling, for their shoes are extremely thin, being made of untanned skins. It is difficult to learn, on enquiry, what the particular species of grass is which is thus in request with these people, as some use one sort, and some another. It is, however, always a species of Carex, and we understood, chiefly this."

PAPER MULBERRY TREE, is a native of Japan and the South Sea islands. From the bark of this tree the inhabitants of Japan and China make their paper, and in those countries the tree is cultivated for that purpose, much after the same manner as osiers are cultivated with us, by cutting down the young shoots in December, after the fall of the leaf.

Order 4. Four Stamina.

The young bark, when the outer rind is taken off, is boiled in a lye till it will readily split into fibres, it is then washed in pure water, and beaten into a pulp; after which, with an infusion of rice, and a mucous water prepared for that purpose, the pulp is made of a due consistency, and paper is manufactured from it.

The finest and whitest cloth worn by the principal people of Otaheite, and the Sandwich Islands, is made of the bark of this tree.

The juice of the Paper Mulberry is used in China as a glue, for gilding either paper or leather, but not wood.

COMMON ARROW-HEAD, so called from the shape of its leaf. This plant is one of the most beautiful ornaments of our rivers, pools, and ditches. The individual flowers are of short duration; but there is

Order 7. Stamina numerous and indefinite.

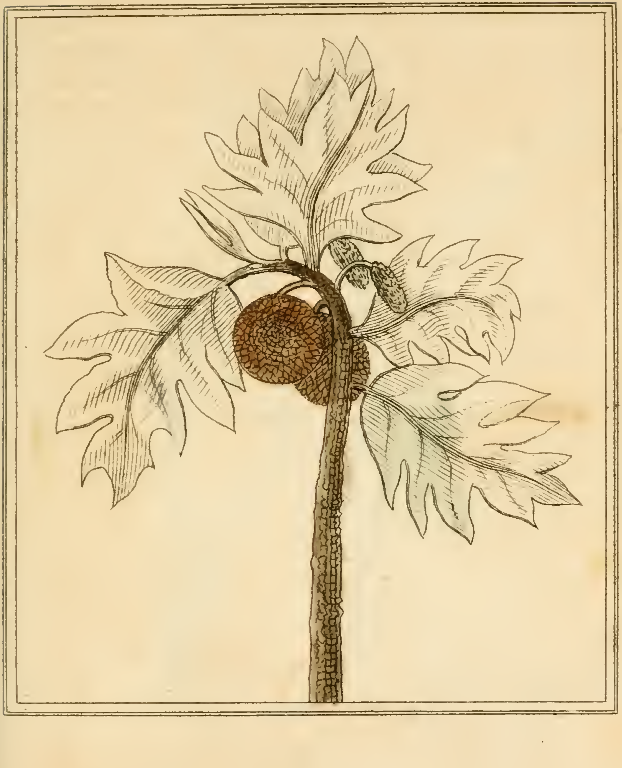
a succession of them through the months of July and August.

It has a bulbous root, containing a good deal of flour, which may be easily extracted, to be used as starch or as flour. The root itself is good food for cattle. This plant, though totally neglected by us, is cultivated in China, and supplies whole districts with food.

CLASS XXI

ORDER 1

BREAD-FRUIT TREE

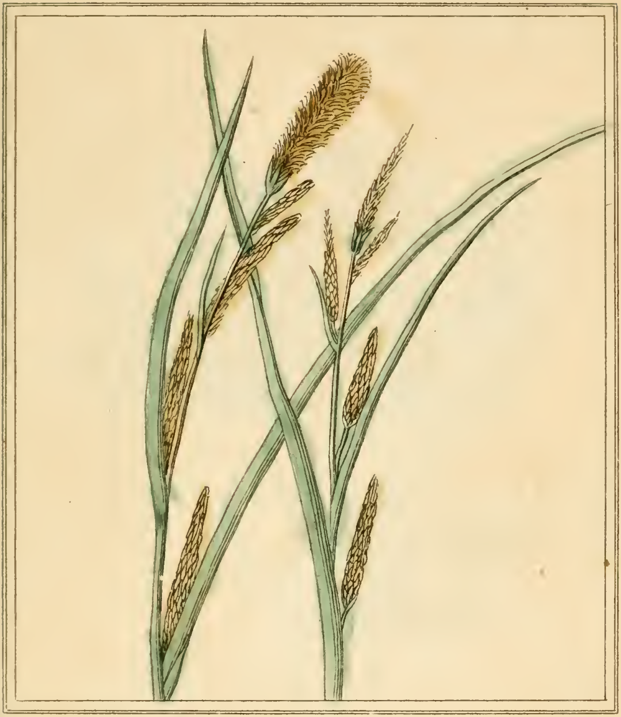


ARTOCARPUS COMMUNIS

CLASS XXI

ORDER 3

SEDGE

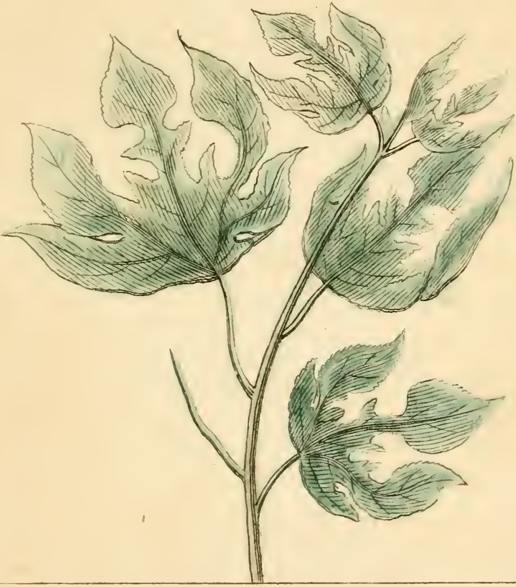


CAREX ACUTA

CLASS XXI

ORDER 4

PAPER MULBERRY TREE

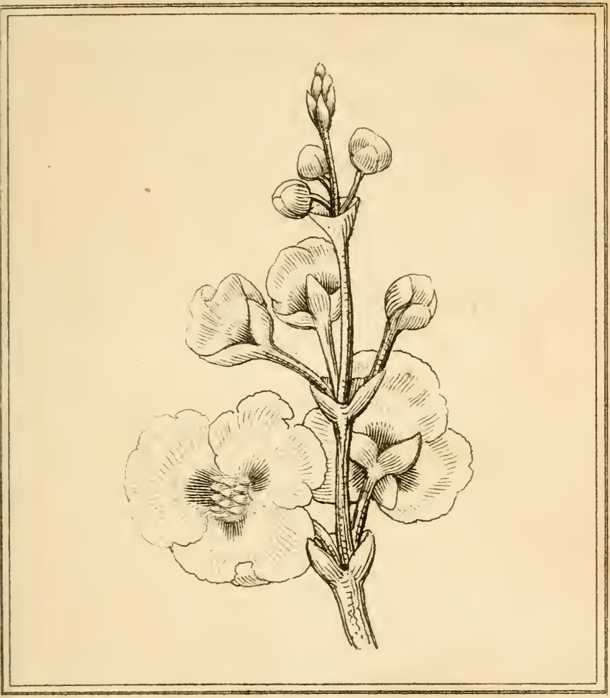


MORUS PAPYRIFERA

CLASS XXI

ORDER 7

COMMON ARROW-HEAD



SAGITTARIA SAGITTIFOLIA

CLASS XXII.

STAMINA AND PISTILLA IN SEPARATE FLOWERS, AND THE TWO SORTS OF FLOWERS GROWING AT THE SAME TIME ON TWO SEPARATE PLANTS.

This Class has eight Orders.

Order 1. One Stamen.

NAJAS. According to Dr. Smith, this plant is a good and immutable example of this Order, and the only one of which he seems to be certain. It is found wild in the canal between Pisa and Leghorn, and in the Rhine near Basle; it has no Calyx nor Corolla.

In the *Histoire de L'Academie François*, published in the year 1719, there is a small figure of this plant which bears the Pistilla, from which the annexed figure is copied, and down to the present time there has been no other published; a circumstance hardly to be credited, in the greatly improved state of botanical knowledge, and the ardour with which it has been cultivated in the different countries of Europe; yet it is still more extraordinary, that of the common Sensitive Plant, *Mimosa Pudica*, there never has been any representation of any credit, and the best, which is exceedingly worthless, was published so long ago as the year 1697.[f]

[f] The work in which this figure is to be found, is entitled

Order 2. Two Stamina.

VALLISNERIA: this is an aquatic plant, and grows in great quantities in Italy, in the canal and ditches in the neighbourhood of Pisa, and also in the Rhone. Its natural habits are highly curious and interesting. The flowers that bear Stamina, are produced at the bottom of the water till they come to maturity, but without expanding; they then separate from the footstalks on which they are borne, and rising to the top, open suddenly with an elastic force, and in this state swim at large on the surface. The other plant producing the Pistilla, bears its flowers on a spiral stem, which, at the same season, has the power of unfolding according to the depth of the water, so as to arrive at the surface at the same time, and thus receive the Pollen from the Antheræ of the floating Stamina. The flowering season being past, the spiral stem then contracts and completes its fructification at the bottom: the other flowers with Stamina, are dispersed and perish.

The flowers producing Stamina are white, those producing the Pistilla are purple.

Order 4. Four Stamina.

MISSELTOE. This plant, instead of rooting and growing in the earth, fixes itself into the branches of trees,[g] where it spreads and forms a bush, conspicuous

---

Horti Medici Amstelodamensis Rariorum Plantarium Historia. The leaves, however, of this Mimosa are admirably represented in Hooke's Micographia, published in the year 1665.

[g] Plants that grow upon others are called Parasitical.

in winter, when it has a yellowish hue. In Worcestershire, and Herefordshire, it is very common in orchards and hedgerows, on Apple-trees. In England it is rarely found on the Oak, but in Hungary it is said to abound on that tree.

This plant is the golden bough of Virgil, which was Æneas's passport to the infernal regions; and it was always considered as sacred by the ancient Druids, but now, with us, it only retains a place at Christmas, to ornament our houses, and supply the means of mirth to the domestic fire side.

It blossoms in May, and produces berries semitransparent, full of a sweetish viscid pulp, inclosing one seed; of these berries bird-lime is made, which would seem to be a very old application of their use, since the English name is derived from a Saxon word, signifying Bird-lime.

Order 5.
Five Stamina.

HEMP. The native soil of this plant is not known with certainty, Linnæus gives it to the East Indies and Japan. It grows in England, in general, to about a man's height, though it has been sometimes known to grow as high as eighteen feet. It is fit for pulling towards the latter end of July, thirteen or fourteen weeks after the seed has been sown. When pulled it is immersed in water and broken, combed, and dressed, nearly in the same way as flax. It is of the greatest importance in the Navy for sails, and all kinds of cordage are made of it, and some kinds of coarse cloth, for domestic purposes. Bombasin is also made of Hemp prepared in a peculiar way with sulphur, which gives it a silky gloss.

An oil is extracted from the seeds. The seeds themselves are reckoned good food for poultry, and are supposed to occasion hens to lay a greater quantity of eggs. Small birds, in general, are very fond of them, but they should be given to caged birds with caution, and mixed with other seeds.

A very singular effect is recorded on good authothority, to have been sometimes produced by feeding Bullfinches and Goldfinches on hemp-seed alone, or in too great quantity: that of changing the red and yellow on those birds to a total blackness.

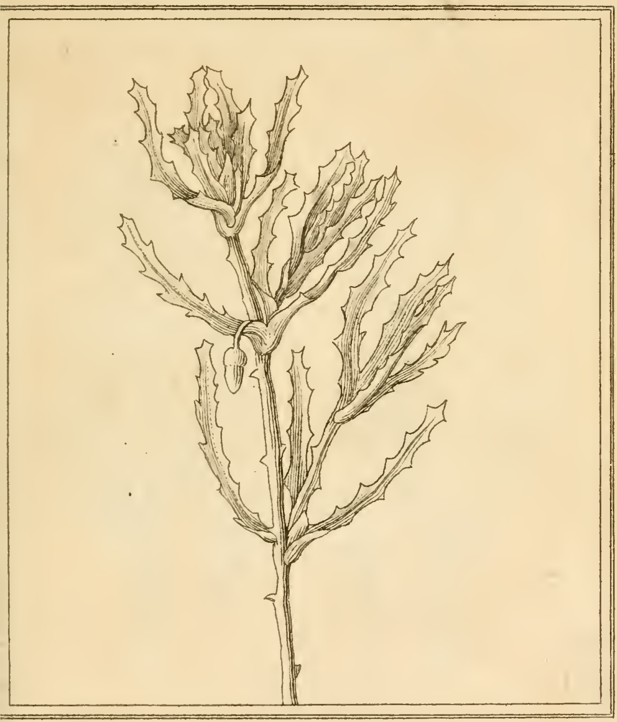
Order 8.
Stamina united together.

YEW. The proper wild situation of the common Yew is in mountainous woods, and more particularly in the clefts of high lime-stone rocks. It blossoms in March and April, and the fruit ripens in autumn. The Calyx, which is originally small, and of a green colour, sustaining an oval flattish seed, at length becomes red, soft, and full of sweet slimy pulp; which is not unwholesome, though the leaves are very poisonous. The wood, amongst our ancestors, was used for making bows, and the tree is supposed to have been planted in church-yards to foster its growth for that purpose; but I suspect the same feelings that introduced the Cyprus, in the East, to gloom the repositaries of the dead, had a principal share in this custom that has prevailed in the northern nations.

CLASS XXII

ORDER 1

NAJAS

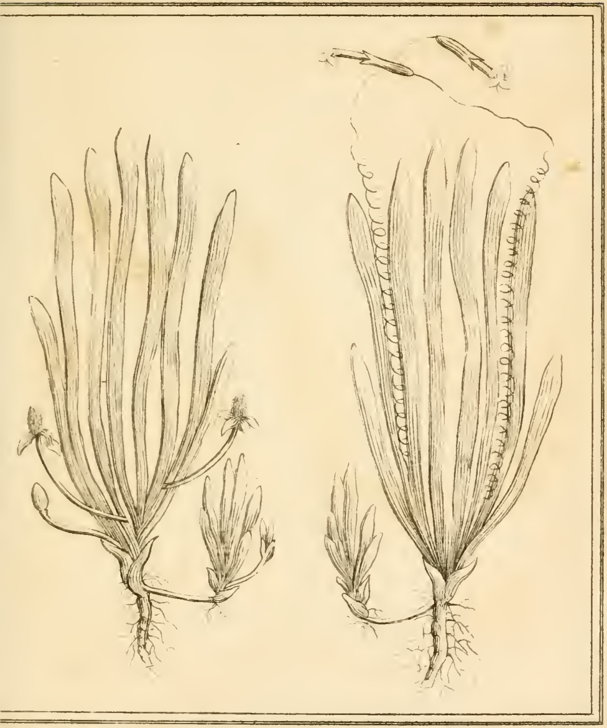


NAJAS MARINA

CLASS XXII

ORDER 2

VALLISNERIA

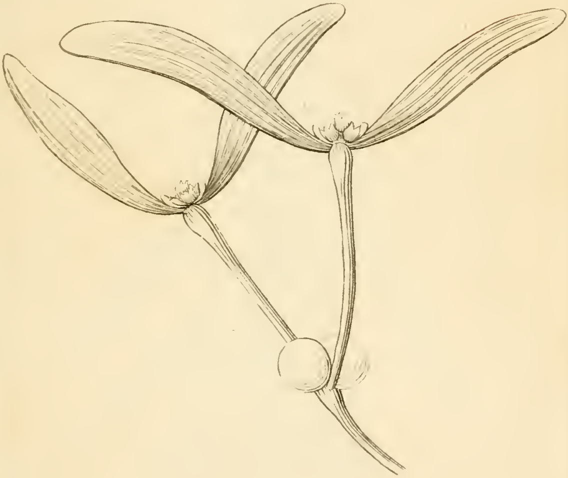


VALLISNERIA SPIRALIS

CLASS XXII

ORDER 4

MISSELTOE

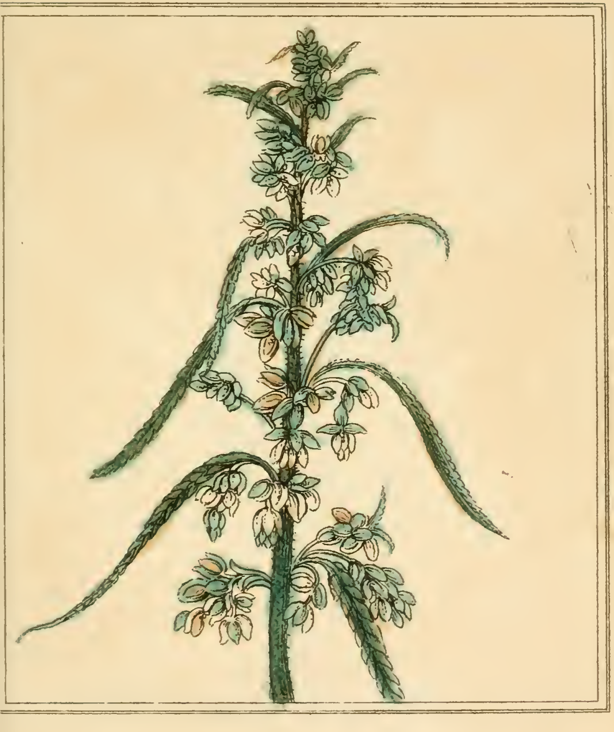


VISCUM ALBUM

CLASS XXII

ORDER 5

HEMP

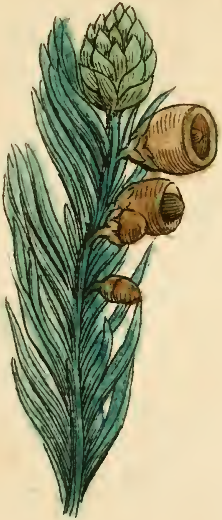


CANNABIS

CLASS XXII

ORDER 8

YEW



TAXUS BACCATA

CLASS XXIII.

STAMINA AND PISTILLA SEPARATE IN SOME FLOWERS, UNITED IN OTHERS, EITHER ON THE SAME PLANT, OR ON TWO OR THREE DISTINCT PLANTS; SUCH DIFFERENCE IN THE ESSENTIAL ORGANS BEING ACCOMPANIED WITH A DIVERSITY IN THE ACCESSORY PARTS OF THE FLOWERS.

This Class has three Orders.

Order 1. *Monoecia,* united flowers accompanied with barren or fertile, or both; all on one plant.

PEDUNCULATED SEA-ORACHE. This plant is selected by Dr. Smith as the best example to illustrate this Order. It grows in salt marshes near Yarmouth, and blossoms in August and September.

Of the second order of this Class *Dioecia,* which requires different flowers on two different plants, no good and unequivocal example has yet been found.

Order 3. *Trioecia,* different flowers on three separate plants.

CULTIVATED FIG. In strict conformity to the rule laid down by Linnæus for this Order, no plant has been found; the structure of the blossoms in the fig being alike in all, and a trifling variation only in the calyx.

The singular structure and œconomy of this plant deserve particular attention. The fruit, or fig itself, not only contains the seeds, but is at the same time the receptacle, enclosing and sustaining the flowers within it.

The annexed figure is the representation of the common Levant Fig, which has within it blossoms bearing only pistilla, and called by way of pre-eminence the *Cultivated Fig*, to distinguish it from another species called *Caprificus*, or Wild Fig.

The wild Fig tree bears successively in the same year three sorts of figs. The first appears in August; and in the months of October and November gradually falls away: the second sort makes its appearance towards the end of September, and remains on the tree till May, in which month a third sort of fruit puts forth, much larger than either of the others, which by the Greeks is called *Orni*. These fruits have all a sleek even skin, and of a deep green colour, and contain in their dry mealy inside, blossoms, some with stamina only, and some with only pistilla, enclosed in the same fig, placed upon distinct foot-stalks, the former above the latter, but none of the fruits are good to eat; nevertheless all of them are said to be essential to the breeding and nourishing in succession a little gnat, on which the maturity of the cultivated fig depends.

From the earliest antiquity the use of the wild fig tree to ripen the cultivated fig was well known, and great care was taken to propagate the *Caprificus* for that purpose, as at this day it is in the Archipelago.

As the flowers of the fig of every species are all closely shut up in their respective receptacles, it has been an interesting subject of enquiry to know how the seeds of the cultivated fig, bearing only pistilla, could be fertilized. Two eminent botanists on the Continent, Pontedera and Tournefort, have investigated this subject, and the result of their investigation is, that a very small kind of gnat, of a black colour, no where to be seen but about these trees, makes a puncture into the figs at the time of their flowering to deposit their eggs, and in passing from one tree to another to perform this office they carry with them the dust of the antheræ, and thus communicate the fertilizing principle to the stigma of the cultivated fig.

In the Levant, where attention to the cultivation of the fig is of the utmost importance to the natives, as well for food as for traffic, the peasants, during the months of June and July, take these wild figs, at the time their gnats are ready to break out of them, to their garden fig trees; and every morning make an inspection, and transfer only such wild figs, which they call *Orni*, as are well conditioned for that purpose. Tournefort says, ‘ he was surprised at the patience of the Greeks in busying themselves for the space of two months in carrying these gnats from tree to tree; but to satisfy his curiosity he was told that one of these fig trees under their management usually produced between two and three hundred pounds of figs, while those of Provence seldom produced more than twenty-five pounds.

In England figs are brought to maturity for the table without the assistance of the wild fig; but the fruit must be distinguished from the *seed*, which alone is necessary to the reproduction of the plant.

If the Pollen be wanting to fructify the seed, experience has shewn in the instances I have before cited from experiments by Linnæus himself, that the seed will not vegetate when sown; the fruit may nevertheless swell, and come to an appearance of perfection, though it is more common to drop off before it ripens if the Pollen has been wanting. The fig tree therefore with us cannot be propagated by seed, but by layers, suckers, or cuttings.

Some species of summer figs in France and Italy, and also in Malta, ripen their fruits and seeds without the assistance of the wild fig; it is, however, necessary to observe, that some species of the cultivated fig tree have a few blossoms, or florets, with stamina placed above those that bear only pistilla within the same covering, and that in warm climates they are perfect, and perform their proper office; but in cold climates, as in England, and even in late seasons in a warm climate, the stamina prove ineffectual, and the seed consequently unproductive.

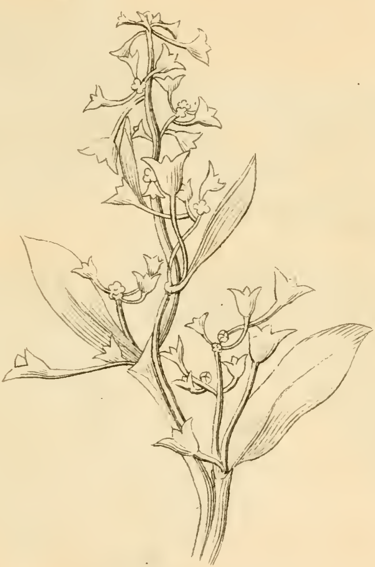
Of the cultivated fig there are thirty species or varieties cultivated in France, Spain, and Italy.

The singular character of the inflorescence of this plant, the variety of the fructification in different species, and the union of the animal kingdom in some instances, as necessary to its reproduction, are phenomena in the highest degree curious and interesting.

CLASS XXIII

ORDER 1

PEDUNCULATED SEA-ORACHA

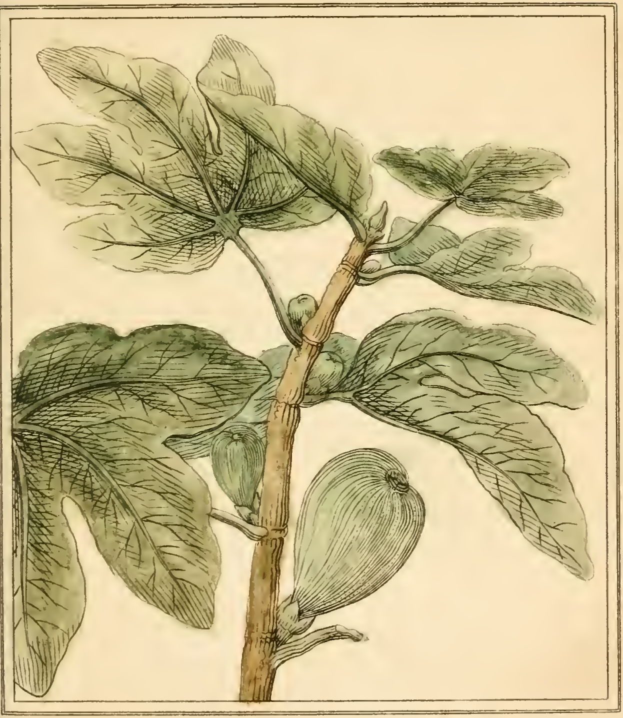


ATRIPLEX PEDUNCULATA

CLASS XXIII

ORDER 3

FIG



FICUS

CLASS XXIV.

THE PARTS OF FRUCTIFICATION OBSCURE OR UNKNOWN.

This Class has four natural Orders.[a]

Order 1. Ferns.

PRICKLY POLYPODIUM. This fern is a native of most parts of Europe, and grows in shady places.

Polypodium is the botanical term for that genus of plants commonly called Ferns, and of which there are enumerated no less than a hundred and thirty-seven species, the greater part of American growth. The investigation of this extensive genus is attended with difficulty from their general resemblance and habit, and from the obscurity of their specific characters.

This Class includes many genera, besides those which are called ferns, in the common acceptation of the word, as Adder's-tongue, Rough Horse-tail, Spleenwort, &c.

Order 2. Mosses.

MATTED HYPNUM. The shoots of this moss are thickly interwoven, and form a close dark-green mat on the decayed bark of trees in damp woods.

---

[a] The botanical names of these Orders are *Filices, Musci, Algæ, Fungi.*

The stalks on which the seed vessels are supported are short and slender, of a reddish colour, scarcely an inch high, and arising out of an oval bulb at the bottom; one of them is given in the annexed plate magnified, that the parts may be more distinctly seen. The seed vessel, which is called a capsule, is urn-shaped, with a lid, which when taken off exhibits a margin fringed with numerous teeth. Upon the number of these teeth a celebrated naturalist[b] has founded a new arrangement of this tribe of plants. By the aid of a microscope he has discovered that there is an invariable uniformity in the number of these teeth in the same species. That there should be such an absolute law in the œconomy of nature in so minute a production is infinitely interesting to the contemplative mind.

Mosses are found in the hottest and coldest climates. They are extremely tenacious of life; and after being long dried, by moisture they easily recover their full vigour of vegetation. Those mosses which grow on barks of trees take much nourishment from them; hence it is observed, that trees which are annually cleared from moss grow nearly twice as fast.

Order 3. Algæ.

REIN-DEER LICHEN. Upon this vegetable the numerous herds of rein-deer, the only riches of the sequestered Laplander, are entirely dependant for their winter food. In that remote region it grows at least a foot high, covering the ground like snow. In England it is less luxuriant, seldom attaining to half that height.

---

[b] Hedwig.

Order 4. Fungi.

MOREL. This fungus is much esteemed as an ingredient in sauces and soups, for which purpose it may be preserved dry for many months or even years. Those who employed themselves in gathering morels in Germany, observed that they grew most plentifully where wood had been burned; and to promote their propagation they were accustomed to set fire to the woods till that practice was prohibited by law.

I have now enumerated the twenty-four Linnæan Classes, and most of the Orders, so as to give a general view of the whole system; and of those that are omitted I trust you will find no inconvenience, or no difficulty to supply them.

To execute my plan of giving an example in the different Classes and Orders, according to the Linnæan system, I have been under the unavoidable necessity of introducing many plants, not common, and some, in this country, only to be found in books; and as this may occasion a little disappointment, I give you as a compensation the following list of flowers, which will be in blossom all at the same time in your garden at Exeter before the middle of February; and thus you may enjoy the gaiety of spring when others are only thinking of its approach. To these I have added the botanical names, that your gardener may make no mistake, and I have given the colour of the flowers that you may exercise your own taste in their arrangement.

Christmas Rose	Helleborus niger	white
Winter Cyclamen	Cyclamen coum	white with red
Winter Aconite	Helleborus hyemalis	yellow
Snow Drop	Galanthus nivalis	white
Spring Crocus	Crocus vernus	different colours
Common Primrose	Primula veris	pale yellow
Tower Mustard	Arabis Siberica	white
Persian Iris	Iris Persica	white and yellow, with deep crimson
Early Starry Hyacinth	Scilla bifolia	blue
Hepatica	Anemone Hepatica	different colours
Bulbous Fumatory	Fumaria bulbosa	white
Mezereon	Daphne Mezereum	a flowering shrub, red, and white

This little parterre may have a border made with the *perennial Draba,* whose little golden flowers will appear at the same time.

In composing this manual for your amusement or instruction I take no credit to myself; I am indebted to the works of the learned Dr. Smith, and to my sincere friend at Abberley, for my slender stock of knowledge; but I ought not to forget Martyn's Virgil, which first gave me the desire to study Botany.

In presenting you with this little book I hope our mutual esteem may not be diminished; for such is the variable texture of the human mind, that while with some, gifts cement esteem, with others they destroy it. One man calculates a gift by its marketable worth, and places against it his higher self estimation. The pride of another feels wounded by being laid under an obligation, and loses no time to return a gift of the same price. A third, that stands with higher importance of rank and fortune than the donor, is offended by the intrusion; and though good breeding forbids him to send back the present that was kindly meant, yet he silently withdraws, and knows the author no more. These cases are within my own experience, and this reflection I make for your instruction, that a parity of intellect and station must be combined to make Friendship durable, and place esteem beyond the mutability of caprice.

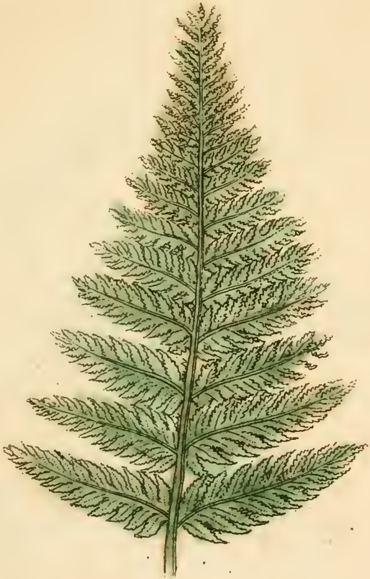
THE END.

T. Bensley, Printer,
Bolt Court, Fleet Street London.

CLASS XXIV

ORDER 1

PRICKLY POLYPODIUM

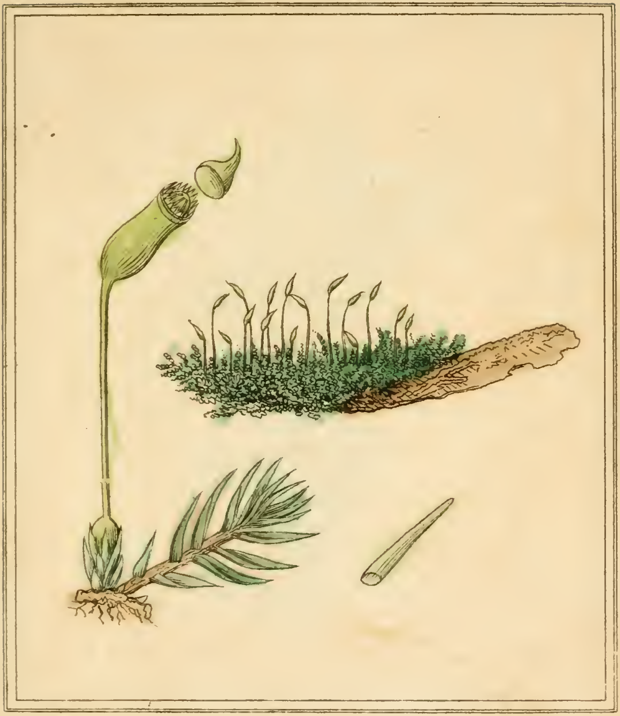


POLYPODIUM ACULEATUM

CLASS XXIV

ORDER 2

MATTED HYPNUM

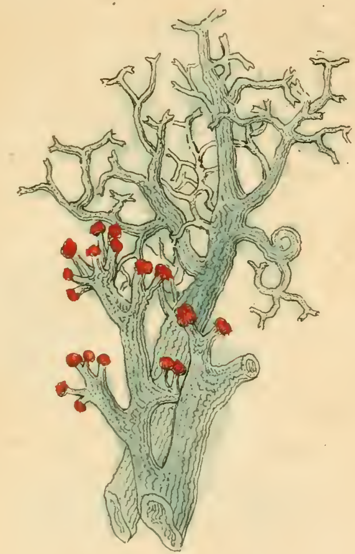


HYPNUM INTRICATUM

CLASS XXIV

ORDER 3

REIN-DEER LICHEN

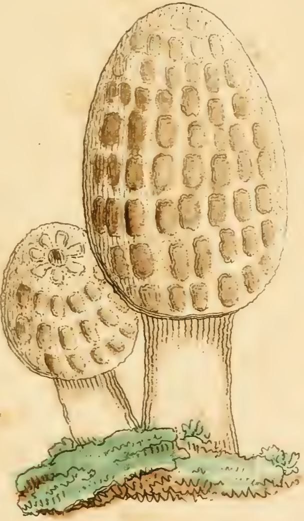


LICHEN RANGIFERINUS

CLASS XXIV

ORDER 4

MOREL



PHALLUS ESCULENTUS

[illegible]12/[illegible]

New York Botanical Garden Library
QK45 .D85 v.1 - 2
gen
Duppa, Richard/Elements of the science o
3 5185 00101 2523